PROCEEDINGS

of the

American Society

of

Civil Engineers

INSTITUTED 1852

VOL. LIV MAY, 1928 NO. 5

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This Society is not responsible for any statement made or opinion expressed in its publications.

Published by the American Society of Civil Engineers at its Headquarters, 33 West Thirty-ninth Street, New York, N. Y., monthly except June and July. Edited by the Secretary, under the direction of the Committee on Meetings and Publications. Reprints from this publication may be made on condition that the full title of Paper, name of Author, page reference, and date of presentation to the Society, are given.

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Printed in the United States. Price $1.00 per copy.

Subscription (if entered before January 1) $8.00 per annum.

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AMERICAN SOCIETY OF CIVIL ENGINEERS

PROCEEDINGS

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SOCIETY AFFAIRS

"PROCEEDINGS" PART 3

With this May, 1928, *Proceedings*, appears the Report of the Stevenson Creek Arch Dam Investigation. It is called Part 3, and the reason for this is not far to seek.

For one thing, it could not conveniently be printed with the regular *Proceedings*—it was too bulky. Even the binders have complained of the growing sizes of the publication and last month (April) begged the privilege of trimming the edge further, that is, "stealing" a bit of the margin, in order that they could get the books into their envelopes!

Then, too, this Report deserves to be printed separately. Although a number of members have united as members of the Committee of Engineering Foundation to cover the component parts, it is essentially a unified undertaking. There is little overlapping of the various treatments and, on the other hand, there is a very evident unity among the many authors who have contributed their individual shares.

No one can study this Report—even a casual skipping of the contents and diagrams—without being impressed with the fact that here is a difficult piece of work ably conceived, thoroughly executed, and finely presented. Apparently, no stone has been left unturned that might reveal a new side of the problem. Every avenue of approach seems to have been threaded. The practical is here and the theoretical; the full-sized test and the model test—almost a plaything; the total deflections have been measured and yet the infinitesimal movements of the bedrock itself have not been ignored.

It might be thought that everything has been said that there is to say. The Committee hopes not. Possibly the widespread publicity now given these results will catch the eye and mind of some genius with an entirely new "slant" on the problem. Perhaps radically new deductions may be extracted from the evidence. These will be welcomed. The Society's publications are opened freely to the fullest discussion on the same basis as a regular paper.

Throughout the entire work and unknown to many members, the Society has had a considerable, albeit largely unofficial, part. It has donated funds and now, in order that it may become available to the entire membership, has offered to relieve Engineering Foundation of part of the publication expense. It expects to provide the forum and means for exhaustive discussion. But further than this its members have contributed largely of the "brains" which are such a large ingredient of the success. All members of the Committee boast membership in the Society, to whom may be added many of the assistants.

Then, too, the past publications cannot be ignored. For several years a large proportion of the papers printed by the Society have dwelt on arch dams, possibly more than on any other one subject, so that the Society has been made to assume the rôle of debating ground for all the important developments in this highly technical field.

Now comes an admirable work to cap the present structure, as it were. It is fitting that the *Proceedings* should house it and that the Society should thus help to sponsor it. To Engineering Founda-

tion, to the various contributors, to the members who have given loyally of effort and ingenuity, to the laboratories, universities, Government bureaus, and to the public service corporations, the thanks of the profession are due. Without each essential part the success would have been incomplete. A more gratifying result of worth-while co-operation than Part 3 of *Proceedings* could hardly be found.

BUFFALO CONVENTION

The week of July 16 is the date. The Buffalo Section of the Society will be the hosts. The general subject for discussion will be "The Regulation of the Niagara River". Such in brief is a bird's-eye view of the Summer Convention. Complete details of course are to be worked out, but enough is known now to insure that the meeting will be of the utmost value.

The question of the Niagara is particularly appropriate. It is impossible to think of Buffalo physically, industrially, or commercially, without considering this adjacent waterway. The general subject has many interesting phases among which may be mentioned the preservation of the Falls; the division of power; and the regulation of levels, flow, and navigation. The Local Committees in conjunction with the Society's Committee on Meetings and Publications may be depended upon to develop some or all of these topics in a useful manner.

Then there will be the Division Meetings. These also are subject to later development, but it appears that a large number of the Society's Technical Divisions could easily find valuable interests and exhibits within easy reach of Buffalo. This applies especially to the Power, Waterways, City Planning, Sanitary Engineering, and Structural Divisions.

On the social side an equally engaging view appears. Headquarters will be at the Statler Hotel, which is amply able to accommodate the meeting. Doubtless, Niagara Falls and its attendant attractions will fill a large place in the scenic trips. Then there is the possibility of the Great Lakes and the St. Lawrence, from which will be developed a social program of great attractiveness. All these local details are in charge of a Committee, of which George H. Norton, M. Am. Soc. C. E., is Chairman.

Buffalo is located strategically for a wonderful meeting. In a sense it is at the cross-roads of traffic for a large part of the Northern United States and Canada. Here railroads and waterways converge. Nature has been most bountiful to this locality and correspondingly industry and commerce have followed. Should a member wish to come by train, by auto, or by ship from New England, from the Atlantic States, or from Canada, he can reach it easily, conveniently, and quickly. The Buffalo Convention cannot help being a success.

WEEKLY ENGINEERING INDEX SERVICE

By a recent extension of the idea of the Engineering Index, which has been favorably known to engineers for many years, it is now possible to secure a digest of up-to-date engineering literature each week. This service is being provided by the American Society of Mechanical Engineers, but covers matters of interest to all branches of the Engineering Profession. Thus is brought to the immediate use of the engineer, the best of current thought and research regularly and without delay.

To accomplish this service, about 1700 publications which come regularly to the Engineering Societies Library are analyzed by a number of editors, each a specialist in a particular field. By properly listing each review, the whole becomes susceptible of cataloging in a permanent file. This file is an essential part of the service.

As an illustration one of the main headings is entitled "Building". Under this, the subdivisions include design, erection, foundations, heating and ventilating, materials, illumination, equipment, and miscellaneous. By means of other main heads the total range of engineering activities is comprehensively covered. These heads are as follows: Aeronautics; Buildings; Chemical; Civil; Electrical; Petroleum, Oils and Natural Gas; Heat; Power; Industrial Management; Mechanical; Mining and Metallurgy; Naval and Marine; Railroads and Railways; Transportation. The total of the subdivisions throughout the whole thirteen main heads is almost 120, or approximately 10 to each principal class.

The daily output averages about 200 cards covering the particular subjects received in that day's periodical file. Each subscriber to the entire service gets such a set of cards daily. The diagram shows a sample quoting an English article slightly reduced in size from the standard of 3 by 5 in. Others, or partial sub-

scribers, receive the cards pertaining to individual subdivisions required, each week.

Of course, the Society publications are fully indexed, not only the papers but the discussions relating to them. The subject headings are made consistent and agree as far as possible with the best consensus of other accepted indexes. A particular advantage accrues from the publication of cross-reference cards inserted with the regular file cards, thus keeping the index in its entirety always strictly up to date.

Bridges, Highway—Steel

Newcastle-Gateshead Bridge. *Engineer*, vol. 144, no. 3755, Dec. 30, 1927, pp. 728-730, 7 figs.

New road bridge under construction consists of single arch over River Tyne, with approach spans on both sides of river; width of roadway is 38 ft.; foundations consist of four masses of concrete sunk by means of caissons under compressed air; arch, which, when completed, will be largest in country, is of mild-steel, two-hinged type, with span from pin to pin of 531 ft. and rise of 170 ft.; abutments which take thrust of steel arch, have all been carried down to solid rock.

4A 4D

The Engineering Index Service.
Serial No. 28—823

SAMPLE, ENGINEERING INDEX SERVICE.

The charges for this service vary with the amount required. For a single subclassification only, the cost is $50 per year. For a larger amount of service, the charge is $300 for a whole main classification, and $2 000 per annum for the entire range of the Service These charges just about cover the cost of the work. The Engineering Index Service, 29 West 39th Street, New York, N. Y., will be glad to supply additional information.

A GREAT STOREHOUSE OF ENGINEERING INFORMATION*

Difficult Inquiries to Answer

One day the Engineering Societies Library received a letter from a poorly educated farmer in the Middle West. He asked for help in the design of electrical apparatus for locating a pot of gold supposed to be buried on his farm by an uncle who had died without telling any one where he had buried it. At first sight this appeared to be merely a freak request which the Library could not answer satisfactorily; but the poor man was serious, and there was a slight possibility that he could be helped. The Library offered some suggestions and asked for more details. In the end the correspondence covered six months, but the farmer never revealed what luck he had in his undertaking. To read about such a quest brings a smile, but if a reader really had reason to believe that a pot of gold was buried on his farm, he would undoubtedly work seriously to locate it.

Letters from uneducated correspondents are not uncommon. The following is typical:

"DEAR SIR:

"Beg to advise you that I have been informed by the. Department of Commerce Bureau of Standards, Washington, D. C.

"That photostate copies. of iron and steel. Determination of. carbon, sulphur, phosphours, magnetic, change in silicon and in chormium, can bee purchased from your Societies Library,

"Kindly informe me if the same can bee purchased in a life like collors,

"Thanking you in advance."

* This is the seventh of a series for the information of the membership of the work of Engineering Societies Library. The first six items were published in November and December, 1927, and in January, February, March and April, 1928, *Proceedings*.

Upon receiving this letter the Library Staff was naturally puzzled and wrote for more specific information as to what was wanted. The following letter was received:

"DEAR SIR:

"Beg to advise you, I am in the market for buying photograph of steel, test,

"Kindly advise me if you can supply me with the same,

"P. S.

"The pictures are photographs showening how to determin the amount of carbon in steels,

"The determination of sulphur, phosphours, magnetic change in silicon and in chromium, in steels.

"Thanking you in advance for your kind information,"

This was answered as well as possible. On another occasion a letter was received from a seaport in South America asking for a "bibliography of dikes." The question arose, Did the writer of the letter mean banks of earth in the form of a levee, or geological intrusions in rock? Both kinds of dikes are proper engineering terms. Investigation showed that the writer was a mining engineer. Therefore, he was sent a bibliography of geological dikes. Since the bill for the service was paid without complaint, the Library Staff seemed to win the guess.

One of the most interesting searches came from the question, What is the difference between a crank and an eccentric? A man who was operating a steam-pump wished to apply the information to his apparatus. Eighteen hours of searching finally led to a 27-page article on the exact subject in the *Transactions* of the American Society of Agricultural Engineers—certainly an unexpected place to find an explanation of a theory of mechanics.

CENTENARY OF BRITISH INSTITUTION OF CIVIL ENGINEERS

An event of great importance to English engineers occurs in London during the week commencing June 3, 1928. To get the proper prospective on this celebration, it is necessary to go back one hundred years, to June 3, 1828. On that date, a Royal Charter was granted to the Institution of Civil Engineers "for the general advancement of Mechanical Science, and more particularly for promoting that species of knowledge which constitutes the profession of a Civil Engineer, being the art of directing the Great Sources of Power in Nature for the use and convenience of man."

This Centenary doubtless will attract the attendance and co-operation of engineers throughout the English-speaking world. It will partake of the nature of both official and social functions. In addition, it is planned to hold an Engineering Conference. This should tempt any American engineers who are within reach of London for that week. It is suggested that any such members communicate with Headquarters in order that the proper programs and information data may be sent for their convenience.

The character and standing of the Institution of Civil Engineers is a guaranty that its Centenary will be observed in appropriate manner. All engineers wherever situated are debtors to this great organization which has ever stood for what is best in the profession. The Society may well rejoice in this anniversary and extend heartiest congratulations on the completion of 100 years of illustrious work and on a future which appears so bright.

RECORD AERIAL TRAMWAY

Those who had the good fortune to study the paper on "Aerial Tramways" by F. C. Carstarphen, M. Am. Soc. C. E., as published in the November, 1927, *Proceedings*, may be interested in the report of a new tramway shortly to be (if not already) put in operation at Camino, Calif. This is said to be the largest yet constructed in America.

An impression of the size may be gained from the fact that it will carry a total load of 29 tons. This includes a car containing about 12 tons of sawed lumber. The idea seems to be to pick up the car and its load on one side of the canyon and transport it across the valley to "spot" it on a track on the other side for continuing its journey.

This will be quite a spectacular installation. The distance between loading and unloading terminals is about 2 700 ft., and the canyon itself is 1 200 ft. deep. Possibly the most remarkable thing about the project is the rapidity of operation, the round trip requiring but little more than 6 min., of which somewhat more than 3 min. is taken up with loading and unloading. Still another feature of the system will be the provision for gravity to operate the motors as the load descends to the center of the span. In this way not only does the motor act as a brake on the speed, but

this brake causes regeneration of current —a scheme widely used in electric railway traction.

Information on this interesting development is furnished by the General Electric Company, which has designed the electrical equipment. The tramway is to be built for the Michigan California Lumber Company.

PRACTICE OF EUROPEAN HYDRAULIC LABORATORIES

From time to time reports have been received from the Society's three Freeman Fund scholars, now studying European practice in connection with hydraulic laboratories. Each of these young engineers seems to be making effective use of his time, but, curiously enough, in different activities.

Contributions to "Proceedings"

One student, F. Theodore Mavis, Assoc. M. Am. Soc. C. E., is studying at Karlsruhe, Germany. He has been applying his experience to the subjects under current discussion in the Society publications. As a result a number of contributions from him have been published in *Proceedings* during recent months, all directed toward hydraulic problems, such as the "New Theory for the Centrifugal Pump", "Hydraulic Design of Flume and Siphon Transitions", and "Stream Flow in General Terms". These matters evidently have been sources of discussion—possibly of investigation—in German laboratories.

Still another activity of Mr. Mavis, similar in nature, has been in connection with a discussion on "Precise Weir Measurements" by Professor Rehbock himself, the noted hydraulician of Karlsruhe. Mr. Mavis kindly translated this valuable document for publication by the Society—a great assistance. It will appear in a future issue of *Proceedings*.

Another student, Lorenz G. Straub, is also studying at Karlsruhe. A letter from him under date of March 11, a sort of running commentary on the scope of this work and the training it affords to young American engineers, requires repetition, almost in full.

Inspection Trip

On the 16th of February (he says), I accompanied Dr. P. Boss, a "Private Dozent" on the faculty at Karlsruhe, on an auto trip down the Murg valley, where we visited several hydraulic structures. The Murg is a near-by tributary to the Rhine. Because of rains and warm weather in the snow-covered highlands of the "Schwarzwald", the Murg reached a flood stage the preceding afternoon, which was the highest recorded since 1896. Nevertheless, no serious damage was noted.

A new study, for a practical undertaking which promises to be very interesting, has been developing in the laboratory during the past month. The study is on a high-water overflow arrangement on the Oder River in the vicinity of Crieort. At this location, gates are opened when the water in the Oder reached an extreme high flood stage, in order to protect the levee against overflow. The water is thus diverted into a large natural low-level basin. In the actual structure, very deep scour has taken place just beyond the apron. The principal purpose of the experimental investigation is to find a method of rectifying the structure so that serious scour may be overcome.

Model Studies

Thus far, two models have been made, both being constructed to a scale of 1 to 50. One of these is a partial model, that is, a section of the spillway built into one of the glass testing flumes available in the laboratory. In this set up, it is possible to observe the progress of scour, the variation in profile of the water surface, and the distribution of destructive eddies for various conditions of flow. A few tests have been made upon this comparative simple model. The characteristic phenomena of flow and the conformation of the sand channel bed after individual tests, were recorded by photography. While instantaneous exposures were necessitated because of moving water and sand particles, flash-lights were used. Other pictures were satisfactorily produced by the time exposures.

The second model is a more involved and complete arrangement in which the structure is laid out very much as it exists in Nature. It has been built into the broad steel river testing flume. The approach channel curvature and contour, the discharge side of the spillway, the levees adjacent to the spillway, and the like, are all formed to correspond to the conditions in Nature as nearly as practicable. A sand bed exists both above and below the spillway. The model has just been completed and it is likely that observations will be under way within the next few days.

Harbor Silting

I have been examining reports and talking with some of the co-workers of Professor Rehbock concerning some of the

older researches as well as some which are now in progress or have recently been completed. One of the most interesting series of experiments, and one which I believe that I have once before mentioned in my correspondence with you, is centered about an investigation of the silting up of harbors on the Lower Maas River. These experiments have been in progress for a good many months. They consist of a study for the design of a suitable harbor entrance for an existing harbor, the Vulcan-Hafen, which lies on the Maas in Holland between Vlaardingen and Rotterdam. It is desired to build a readily accessible entrance to the harbor, and yet one which will allow as little silting up of the passage way as practicable. The procedure and the results are quite unique.

The harbor lies on the right shore of the waterway, the outer shore of a mill curve in the river and about 17 miles from the river's mouth. Though the variation of water level due to tides in this location amounts to an average of about 4½ ft., salt water seldom reaches the harbor. At some periods of the year, the highest stage of the tide exceeds 6 ft.; the highest recorded is 10 ft. To reach these extreme stages, the three factors, namely, spring tide, high water in the upper river, and favorable wind, must be acting simultaneously.

The laboratory model is formed of a concrete framework built directly over the laboratory floor, the top surface of the model being about 18 in. above the floor level. Surfaces of the river bed and harbor entrances are finished with cement mortar. An undistorted scale of 1:250 was used. The model is extended to include several hundred meters of the Maas above and below the "Vulcan-Hafen".

Tidal Flow

As a simplification of the procedure of carrying out the effect of tides and ebbs, the water has been kept flowing uniformly, respectively, either up or down the river, other refinements being made to obtain the effect of filling or emptying the harbors. In order to give the harbor, and especially the entrance, a water movement somewhat similar to that resulting from a rising tide, a small rated siphon is arranged to draw water from the harbor analogous and at a rate proportional, to the lag which is present as the harbor fills with the incoming of the tide. As the tide lowers, in contradistinction, the siphon is used to supply water.

An extremely fine water-soaked paper pulp has been used as a material corresponding to the suspended sediment in Nature. Photographs are taken of the sedimentation resulting in each experiment. The major portion of the deposition takes place near the harbor entrance.

The direction of flow of the water at the surface can be observed by distributing particles of paper over the moving water. Records of the movement are made by taking photographic time exposures. Flow phenomena at the bottom may be observed by dropping particles of soluble colored matter into the water.

Deductions from Harbor Tests

This series of experiments is still in progress; however, it is possible to draw some general conclusions from the laboratory tests as well as from the field investigations. The laboratory work has, in general, borne out facts obtained from observation in the field. With regard to keeping the deposit a minimum, it may be added that:

(*a*) The width of the entrance of the harbor should be kept at a minimum (the smallest width is, of course, limited by the danger to ships entering the harbor from a lively moving stream into relatively still water).

(*b*) In considering the proper depth for the narbor, it should be remembered that if the depth is too great the ground stream, which is rich in fine sediment, will be given unhindered entrance, while if the depth is too small, there is danger of large reductions in the movement of water in the harbor with resulting deposits.

(*c*) In periods of tide reversal, sedimentation can be avoided only by maintaining a lively movement of boats in the harbor.

(*d*) If at all possible, a harbor should not be constructed on the inner shore of a river bend, because here the greatest amount of sedimentation may be expected.

(*f*) On the outer shore of a curved portion of a stream, subject to tidal effects, the best point for the harbor entrance seems to be somewhat up stream from the middle point of the bend.

(*g*) Most important, the location of the entrance relative to the river has been more influence upon the resulting deposit in the harbor than the form of harbor or entrance.

With regard to the effect of wind, it may be said that if the wind is directed

from the river toward the harbor, a flowing of water producing a reduction in silting of the harbor results, while a wind in the opposite direction produces disadvantageous influences.

Experimental Work in Its Infancy

While the investigation is quite out of the ordinary and consequently of more than ordinary interest, it is only one of the several series of experiments that have recently been carried on in this laboratory. However, that the development of experimental river and harbor hydraulics is still in its infancy, even in Germany, is self-evident when one considers the conflicting views of various authorities. This is especially true with regard to views of the underlying principles of the entire work, namely, the laws of similarity and their limitations. Nevertheless, it is probably a healthy condition, rather than a drawback. It will be interesting indeed when some of these factors receive a lively discussion in American literature.

The third student, Morrough P. O'Brien, Jun. Am. Soc. C. E., is confining his labors for the present to Norway and Sweden. He, like Mr. Mavis, has submitted discussions to *Proceedings*. Further, he has supplied a 50-page report dealing with the many projects and laboratories in the Scandinavian countries. A few extracts from this will serve to illustrate some of the problems that are engaging the best engineering minds in these northern lands where water power is such a boon.

Turbine Tests in Norway

Hydraulic laboratory work seems to be devoted largely to testing of turbines and other matters incident to power production. As illustrating the value of such work, Mr. O'Brien quotes from tests on the turbines for the hydro-electric plant for the City of Oslo, located at Solbergfos. Two important Norwegian turbine manufacturers co-operated for this testing, extending from January, 1920, to August, 1924. They investigated fifty different model runners. These models on a scale of 1:4 were tested under a head of 4.5 m. corresponding to a head of 21 m. at the plant. As a result the efficiency of the models themselves was raised from 88 to 92%, and the acceptance tests on the runner gave 94.5% efficiency.

Likewise, financially, the experiments were most satisfactory. Although they cost 65 000 crowns (about $16 000), this amount was more than covered by the bonus resulting from improved efficiency. Considering the penalty which would have been paid for lowered efficiency, this margin was most gratifying. The net results were not only a considerable profit, but a valuable experimental experience. For one thing, the tests showed that small changes in the area between the blades had a proportionally greater effect on the efficiency. This means that the workmanship has to be very exact when the large runner is constructed from a model.

Causes of Turbine Pitting

Still another important branch of research carried out in many of these laboratories has to do with turbine pitting and its causes. In general, the consensus is that this action is purely mechanical. For example, tests were made on about 30 disks of different materials placed in a small glass channel. These disks had small projections on one side which were placed against a glass plate so that water at high velocity could be forced past the projections. Cast iron showed the most pitting, cast steel showed less, and chrome or stainless steel indicated very little. It was remarkable, however, that the glass also was pitted.

The conclusion was that the cause lay in the high pressure produced when a cavity in the water stream collapsed on striking the runner. In this, most of the Scandinavian authorities agree, although some blame the chemical action, basing this conclusion on the fact that the pitting always occurs at low-pressure areas on the blades where oxygen would be freed from the water. A further view blames the joint action of corrosion and erosion.

ADVANCE PLANS FOR TOKIO CONGRESS

The World Engineering Congress to be held in Tokio, Japan, in the fall of 1929, at least as far as the American participation is concerned, got off to a flying start at a dinner held in Washington, on March 22. With the Japanese Ambassador, His Excellency Tsuneo Matsudaira, as host, many of the members of the American Committees were in attendance. These comprised eminent engineers from all walks of life and representing the various engineering societies and fields.

Aside from the delightful social occasion, this event placed the whole program before representative engineers. Formal organization of the American Committees resulted, thus providing the machinery whereby the fullest participation of all interested engineers and organizations may be secured.

According to the preliminary program issued from Tokio on behalf of the Kogakkai (Engineering Society of Japan), the Congress proposes to discuss various engineering subjects with the purpose of promoting international co-operation in the study of engineering science and various engineering problems, and further to cultivate a feeling of brotherhood among engineers throughout the world.

Among the subjects noted for detailed discussion at the Congress are included general engineering problems; engineering science as applied to materials, thermodynamics, etc.; public works; communication and transportation; power; and water-works. This is only a partial list such as might appeal especially to the civil engineer. Similar topics of major importance to other fields are listed so that the total ground covered will be both wide and inclusive. Further details will be forthcoming as the plans mature.

Meeting of Executive Committee

This is an abstract of the notes of the Secretary and subject to approval by the Executive Committee at its next meeting.

The Executive Committee met at Society Headquarters on April 9, 1928, at 9:40 A. M.; President Lincoln Bush in the chair; George T. Seabury, Secretary; and present, also, Messrs. George W. Fuller, John C. Hoyt, George Ray, and Treasurer Otis E. Hovey.

Approval of Minutes

The minutes of the meeting of the Committee held on December 15, 1927, and supplement thereto, were approved as adopted by the Board of Direction.

Centenary of the Institution of Civil Engineers

In response to an invitation from the Institution of Civil Engineers to the Society to be represented at the ceremonies in celebration of the Centenary of the Incorporation of the Institution of Civil Engineers by Royal Charter, in London, England, beginning June 3, 1928, the Secretary was appointed a delegate of the Society and an allotment in payment of expenses was made. The appointment of a second delegate was left in the hands of the President.

Dedication of Louvain Memorial

To represent the Society at the ceremonies of dedicating the clock and carillon for the Tower of the Library Building of the University of Louvain, July 4, 1928, the following delegates were appointed: Past-President, George S. Davison, to represent President Bush, Secretary Seabury, and Messrs. W. K. Hatt and W. J. Barney.

World's Engineering Congress, Tokio, October, 1929

An invitation to the Society to participate in the World's Engineering Congress to be held in Tokio, Japan, in October, 1929, was accepted. The Secretary reported the co-operation and participation in the work of the American Committee of the Congress on the part of several members of the Society.

Many other items of Society business were considered and acted upon to facilitate the April meeting of the Board of Direction.

Local Sections*

Arizona.—March 24, 1928. Through the courtesy of Major Charles R. Olberg, Assistant Chief Engineer, the U. S. Indian Service, in charge of the construction of the Coolidge Dam, and of Mr. Keir of Atkinson, Keir Brothers, and Spicer Company, Contractors for the dam, this meeting of the Section was held at the site of the dam. A few matters of business were attended to, after which the entire time was devoted to inspection and study of the construction. Attendance 27.

Baltimore.—April 13, 1928. At a meeting of the Section held at the Engineers Club, Willard Chevalier, General Manager, *Engineering News-Record,* gave an address on "The Engineer and His Allies". An informal discussion followed, concerning the training of Engineers to deal with present-day economic conditions. Attendance 21.

Colorado.—February 13, 1928. Ladies' night for the Section was celebrated by a social dinner meeting held at the Lakewood Country Club, of Denver. Music and other interesting entertainment were provided during dinner, after which Mr. Edward M. Milligan gave an illustrated talk on "Colorado Romance Trails". Old acquaintances were renewed and the evening, in every way, proved a great success. Attendance 50.

March 12, 1928. This was a dinner meeting held at the University Club, Denver. Ralph L. Parshall, Irrigation Engineer in Charge of the U. S. Department of Agriculture Experiment Station, at Fort Collins, gave an illustrated talk on the "Improved Venturi Flume", which he has developed at the Bellevue Hydraulic Laboratory near Fort Collins, and which he has constructed in many Colorado irrigation ditches. Mr. John E. Hayes further discussed this method of measuring water, using as his source of comparison various flumes of somewhat similar design, that he has built. Various communications dealing with Section and Society matters were then read and the meeting adjourned. Attendance 26.

Illinois.—March 5, 1928. A joint luncheon meeting of the Section and the members of the Chicago Engineers' Club was held in the Engineers' Club Rooms, Chicago. After luncheon, the Hon. Edwin P. Morrow, ex-Governor of the State of Kentucky, addressed the meeting. A business meeting followed which was opened by a short address by President Moss. A resolution was passed in approval of the Parker Bill relative to the co-ordination of the public health activities of the Government, and Joel I. Connelly, Chief Sanitary Inspector for the City of Chicago, spoke in its favor. After the appointment of various committees for 1928, President Moss stated that it had been decided to hold bi-monthly meetings of the Section, and to establish separately the offices of Secretary and Treasurer. Accordingly, Mr. C. W. Haupt has been appointed to act as Treasurer for 1928. The attendance at the luncheon was 121, and at the business meeting, 33.

Kansas City.—March 5, 1928. The Annual Dinner Meeting was held at the University Club, the speakers of the evening being Dean George C. Shaad,

* For list of Local Section Officers, Rules, etc., see 1928 Year Book, p. 46.

of the University of Kansas, and Dean E. J. McCaustland, of the University of Missouri. The following officers were elected for the ensuing year: President, Charles A. Haskins; First Vice-President, A. E. Harvey; Second Vice-President, Arthur C. Everham; and Secretary-Treasurer, J. F. Brown. Attendance 34.

Philadelphia.—March 14, 1928. A meeting of the Section, preceded by the usual "Good Fellowship Dinner", was held at the Engineers' Club. Professor Frank P. McKibben, who is Consulting Engineer for the electrically-welded building being erected at the West Philadelphia Plant of the General Electric Company, addressed the Section on the "Electric Welding of Steel Buildings and Bridges". Through the courtesy of the General Electric Company, an inspection of this building to which Professor McKibben's subject was directly applied, had been made in the afternoon. A discussion followed which was participated in by Messrs. Andrew Vogel, Engineer for the General Electric Company, Schenectady, N. Y., who showed lantern slides, John Upp, of the General Electric Company, Philadelphia, J. H. Edwards of the American Bridge Company, New York, N. Y., H. S. Richards, of Harris and Richards, Architects for the new welded building of the General Electric Company in West Philadelphia, and W. W. K. Freeman. Attendance 225.

Portland (Ore.).—March 15, 1928. The regular bi-monthly meeting of the Section was held at the University Club. It was decided that the Newton Bill be endorsed by suitable resolutions to be prepared by the official board. The recent failure of the St. Francis Dam near Los Angeles, and the request made to the Society by the Los Angeles Chamber of Commerce for the names of engineers qualified to serve on a board of inquiry, was discussed. Illustrated talks were then presented by Mr. R. M. Murray on "The Twin Falls-Jerome Cantilever Bridge", and by Mr. R. F. Hoffmark on "The Construction of the Cascade Tunnel, Washington." Attendance 20.

Sacramento.—February 28, 1928. Glenn L. Weber, Engineer for the Pacific Telephone and Telegraph Company, gave an illustrated talk on "Television". The Newton Bill was endorsed by the Section, and the promise of co-operation from the various California Congressmen and from Governor C. C. Young was secured. Attendance 50.

March 6, 1928. Dr. F. J. Veihmeyer, Assistant Professor of Irrigation Investigations and Practice at the Agricultural College at Davis, Calif., spoke on the "Classification of Soils". Attendance 43.

March 13, 1928. The St. Francis Dam, which recently failed, was described by Edward Hyatt, State Engineer. Attendance 27.

Syracuse.—March 12, 1928. A Dinner Meeting of the Section was held at the Onondaga Hotel, at which Secretary Seabury was the guest of honor. After the dinner he addressed the Technology Club, with which this Section is affiliated, concerning the method of operation of a National Engineering Society, and also concerning the status of engineers in general. The attendance at the dinner was 29 and at the joint meeting, 92.

Engineering Societies Library

The services of the Engineering Societies Library are available to all members who wish searches, copies, translations, etc., or advice on technical literature. A collection of modern books is also available for loan to members in North America, at moderate rentals. Correspondence should be addressed to the Director, Engineering Societies Library, 29 West 39th Street, New York, N. Y., who will gladly give information concerning the charges for the various kinds of work. A more comprehensive statement in regard to this matter will be found on pages 71 and 72 of the Year Book for 1928.

Book Notices*

(March 1 to March 31, 1928)

Eiserne Balkenbrücken. By Joseph Melan. Berlin und Lpz., Walter de Gruyter & Co., 1928. 106 pp., illus., 6 x 4 in., lines. 1,50 r.m.

This brief text covers the essentials of the design and construction of steel bridges.

English for Engineers. By S. A. Harbarger. Second Edition. N. Y., McGraw-Hill Book Co., 1928. 300 pp., 7 x 5 in., cloth. $2.00.

This book treats of English as a tool for transmitting thought and is planned to assist the engineer in acquiring skill in its use as a professional aid. It takes up first letters of application, telegrams, orders, inquiries, and instructions, and the sales letters, which engineers must write; and then proceeds to more formal writing for publication.

Highway Materials. By Edward E. Bauer. N. Y., McGraw-Hill Book Co., 1928. 353 pp., illus., diagrams, tab., 9 x 6 in., cloth. $3.50.

While intended primarily to give students of highway engineering a general knowledge of the qualities of materials wanted for various kinds of pavements, this book will also be useful to engineers when writing specifications or inspecting materials for construction. This textbook covers the production of each material, the purpose and value of each test applied to it, the qualities of material desired for each type of pavement, typical specifications, sampling and detailed instructions for making the various tests.

Motor Traffic Management. By G. Lloyd Wilson. (Transportation Series.) N. Y., D. Appleton & Co., 1928. 251 pp., charts, graphs, 9 x 6 in., cloth. $3.00.

After collecting data on traffic problems of motor bus and truck operators the author has applied to these problems the principles of traffic management derived from the economic fundamentals to railroad, express, and steamship business.

Additions to the Reading Room

My World. By Arthur E. Morgan, Vice-President, Am. Soc. C. E. Second Edition. Yellow Springs, Ohio, Kahoe & Spieth, 1927. 72 pp., 9 x 6 in., paper.

This book, the companion volume to "Finding My World", presents the author's philosophy and interpretation of the constant values of life in a modern and changing world. It is an expansion of a syllabus used for some years under the title, "My World", with classes at Antioch College.

Finding His World: A Story of Arthur E. Morgan. By Lucy Griscom Morgan. Second Edition. Yellow Springs, Ohio, Kahoe & Spieth, 1927. 108 pp., 9 x 6 in., paper.

In this book, Mrs. Morgan has detailed in an informal and delightful manner, the story of the life of her husband, Arthur E. Morgan, Vice-President, Am. Soc. C. E., including characteristic sketches of his boyhood and the evolving of his practical and spiritual convictions of life into one harmonious whole.

* The statements made in these notices are taken from the books themselves, and this Society is not responsible for them. Unless otherwise specified, the books in this list have been donated by publishers.

Current Civil Engineering Literature

Key to Abbreviated References to Publications Indexed*

Abbreviated References	Publication.	Place.
Am. C. Inst.	*American Concrete Institute, Proceedings* (Y.)	Detroit
A. I. E. E.	*American Institute of Electrical Engineers Journal* (M.)	New York
A. R. E. A.	*American Railway Engineering Association, Proceedings* (Y.)	Chicago
A. S. T. M.	*American Society for Testing Materials, Proceedings* (Y.)	Philadelphia
Am. Soc. C. E.	*American Society of Civil Engineers, Proceedings* (M.)	New York
Am. Soc. Mun. Impvts.	*American Society for Municipal Improvements, Proceedings* (Y.)	New York
Am. W. W. Assoc.	*American Water Works Association, Journal* (M.)	Baltimore
Am. Wood Prs. Assoc.	*American Wood Preservers Association, Proceedings* (Y.)	Chicago
Ann. P. et C.	*Annales des Ponts et Chaussées* (Bi-M.)	Paris
Ann. T. P. Belg.	*Annales des Travaux Publics de Belgique* (Bi-M.)	Brussels
Assoc. Ing. Gand.	*Annales de l'Association des Ingénieurs sortis des Ecoles Spéciales de Gand* (Q.)	Ghent
Bost. Soc. C. E.	*Boston Society of Civil Engineers, Journal* (M.)	Boston
Can. Engr.	*Canadian Engineer* (W.)	Toronto
City Plan.	*American City Planning Institute* (Q.)	Boston
Comwlth Engr.	*Commonwealth Engineer* (M.)	Melbourne
Cornell C. E.	*Cornell Civil Engineer* (M.)	Ithaca
Dock & Harbour	*Dock and Harbour Authority* (M.)	London
Eng.	*Engineering* (W.)	London
Eng. & Contr.	*Engineering and Contracting* (M.)	Chicago
Eng. Inst. Can.	*Engineering Institute of Canada, Journal* (M.)	Montreal
Eng. N. R.	*Engineering News-Record* (W.)	New York
Engr. Soc. W. Pa.	*Engineers' Society of Western Pennsylvania, Journal* (M.)	Pittsburgh
Engr.	*Engineer* (W.)	London
Engrs. & Eng.	*Engineers and Engineering, Engineers' Club of Philadelphia* (M.)	Philadelphia
Gas und Wasser.	*Gas und Wasserfach*	Munich
Gen. Civ.	*Le Génie Civil* (W.)	Paris
Gesund. Ing.	*Gesundheits Ingenieur* (W.)	Munich
Inst. C. E.	*Institution of Civil Engineers Minutes of Proceedings* (Q.)	London
Inst. Mun. & Co. Engrs.	*Institution of Municipal and County Engineers, Journal* (W.)	London
Int. Ry. Cong. Assoc.	*International Railway Congress Association, Bulletin* (M.)	Brussels
Land. Arch.	*Landscape Architecture* (Q.)	Boston
Mech. Eng.	*Mechanical Engineering* (M.) *Journal of the American Society of Mechanical Engineers*	New York
Mil. Engr.	*Military Engineer* (Bi-M.)	Washington
Min. & Metal.	*Mining and Metallurgy* (M.) *American Institute of Mining Engineers*	New York
Mun. N.	*Municipal News* (M.)	Chicago
N. E. W. W. Assoc.	*New England Water Works Association, Journal* (Q.)	Boston
N. Y. R. R. Club	*New York Railroad Club, Proceedings* (M.)	Brooklyn
Oest. Ing. Arch. Ver.	*Oesterreichischer Ingenieur und Architekten Verein, Zeitschrift* (F.)	Vienna
Power	*Power* (W.)	New York
Public W.	*Public Works* (M.)	New York
Rev. Gen.	*Revue Générale des Chemins de Fer* (M.)	Paris
Ry. Age	*Railway Age* (W.)	New York
Ry. Eng. & Main.	*Railway Engineering and Maintenance* (M.)	Chicago
R. & S.	*Roads and Streets* (M.)	Chicago
Schw. Bauz.	*Schweizerische Bauzeitung* (W.)	Zurich
Sci. Am.	*Scientific American* (M.)	New York
Soc. Ing. Civ. Fr.	*Société des Ingénieurs Civils de France, Mémoires et Comptes Rendus* (Q.)	Paris
Tech. Gemein.	*Technisches Gemeindeblatt* (F.)	Berlin
Ver. deu. Ing.	*Verein deutscher Ingenieure, Zeitschrift* (W.)	Berlin
W. W.	*Water Works* (M.)	Chicago
West. Constr. N.	*Western Construction News* (F.)	San Francisco
West. Ry. Club	*Western Railway Club, Proceedings* (M.)	Chicago
West. Soc. Engrs.	*Western Society of Engineers, Journal* (M.)	Chicago
Zeit. Bau.	*Zeitschrift für Bauwesen* (Q.)	Berlin
Z. d. Bauver.	*Zentralblatt der Bauverwaltung* (W.)	Berlin

* Y = Yearly; Q = Quarterly; M = Monthly; F = Fortnightly; W = Weekly.

A. Applied Sciences

a. Processes of Calculation

2. Graphical and Nomographical Processes

Détermination Graphique de l'Action des Terres. Contribution au Calcul de Stabilité des Murs de Soutènement.* (Graphic Determination of the Action of Earth. Contribution to the Calculation of the Stability of Retaining Walls.) Raoul de Diesbach. Schw. Bauz. Serial beginning Feb. 11, '28.

Einfache graphische Konstruktionen des Schaubildes von Exponentialfunktionen der Form $x = a\ k^y$.* (Simple Graphical Construction of the Diagram of Exponential Functions of the type $x = a\ k^y$.) Erich J. M. Honigmann. Oest. Ing. Arch. Ver. Mar. 2, '28.

3. Stresses and Strains

A Graphic Method for Determining the Stresses in Circular Arches under Normal Loads by the Cain Formulas. Discussion: Lars R. Jorgensen. Am. W. W. Assoc. Mar., '28.

B. Applied Mechanics

a. Mechanics of Solids (Strength of Materials)

6. Heterogeneous Solids (Reinforced Materials)

Efforts Elastiques Développés dans les Barrages-Voutes par les Diverses Conditions de Température et de Retrait du Béton.* (Elastic Stresses Developed in Arch Dams by the Various Conditions of Temperature and Shrinkage of the Concrete.) Haegelen. Ann. P. et C. Nov., '27.

b. Hydraulics

1. Processes of Measurement

Chemical-Electric Measurement of Water.* A. Barbagelata. Am. Soc. C. E. Mar., '28.

Precise Weir Measurements. Discussion: R. L. Parshall. Am. Soc. C. E. Mar., '28.

Wassermengenbestimmung mittels hydrometr. Flügeln und zentralisierten Bandchronographen im Kraftwerk Faal a. d. Drau.* (Water Measurement by Hydrometric Vanes and Centralized Strip Chronographs in the Faal a. d. Drau Power Plant.) P. Perrochet and C. Montandon. Schw. Bauz. Feb. 25, '28.

2. Physical Hydraulics

Wie bestimmt man zuverlässig die Liefermengen, Strömungsgeschwindigkeiten und Druckhöhen für verzweigte Rohrleitungen?* (How Can One Determine Reliably the Discharge, Velocities of Flow and Pressures for Branched Pipe Lines?) Hans Rudolf Karg. Gesund. Ing. Jan. 14, '28.

Anwendbarkeit der einfachsten Durchflussformel für Düsen und Stauränder.* (Applicability of the Simplest Flow Formula for Nozzles and Orifices.) M. Jakob and W. Fritz. Ver. deu. Ing. Jan. 28, '28.

3. Industrial Hydraulics

The Chelan Hydroelectric Project.* A. G. Darwin. West. Constr. N. Jan. 25, '28.

Mono-Bear Creek Siphon.* E. R. Davis. West. Constr. N. Feb. 25, '28.

Smoky Falls Hydro Power Development. Can. Engr. Feb. 14, '28.

The Role of the Civil Engineer in Power Development. Discussion: P. Junkersfeld, Geo. A. Orrok, Joel D. Justin, and F. W. Scheidenheim. Am. Soc. C. E. Mar., '28.

Water-Power Appraisals. Discussion: Le Roy K. Sherman. Am. Soc. C. E. March., '28.

New Theory for the Centrifugal Pump.* Discussion: F. Theodore Mavis. Am. Soc. C. E. Mar., '28.

Kraftwerk der Bergbau- A.-G. Lothringen auf Schacht IV in Gerthe bei Bochum.* (Power Plant of the "Bergbau-A.-G. Lothringen" at Pit IV in Gerthe near Bochum.) Paul Dettenborn. Ver. deu. Ing. Serial beginning Jan. 28, '28.

Zwei Wasserkraft-Projekte in den französischen Alpen.* (Two Water-Power Projects in the French Alps.) W. Sattler. Schw. Bauz. Feb. 4, '28.

4. Dams

Baffile-Pier Experiments on Models of Pit River Dams.* Discussion: B. E. Torpen, Oren Reed and Harold K. Fox. Am. Soc. C. E. Mar., '28.

Efforts Elastiques Développés dans les Barrages-Voutes par les Diverses Conditions de Température et de Retrait du Béton.* Elastic Stresses Developed in Arch Dams by the Various Conditions of Temperature and Shrinkage of the Concrete.) Haegelen. Ann. P. et C. Nov., '27.

c. Pneumatics

2. Physical Pneumatics

Wind-Braced High Buildings in the Florida Hurricane.* (From report of Struc. Div. Am. Soc. C. E.) Eng. N. R. Mar. 1, '28.

C. Materials of Construction and General Processes

a. Lime, Cement, Mortar, Concrete, Brick, Bitumin, Timber, etc.

Practical Observations on Stability in Bitumens.* R. W. Parkhurst. Comwlth. Engr. Feb. 1, '28.

Timber and Its Proper Utilization.* Axel H. Oxholm. Mil. Engr. Mar.–Apr., '28.

The Requirements for a Durable Concrete as Observed from Structures in Service.* Roderick B. Young. Eng. Inst. Can. Mar., '28.

The Condition of Field Specimens of Concrete Exposed to Alkali Soils and Waters Examined in December, 1927. Eng. Inst. Can. Mar., '28.

Notes on the Relative Resistance of Various Cements to the Action of Sulphate Waters.* T. Thorvaldson. Eng. Inst. Can. Mar., '28.

The Effect of Steam Treatment of Portland Cement Mortars on Their Resistance to Sulphate Action.* T. Thorvaldson and V. A. Vigfusson. Eng. Inst. Can. Mar., '28.
Recherches sur la "Maladie" de Certains Bétons au Ciment Alumineux.* (Investigations of the "Disease" of Certain Concretes of Aluminous Cement.) R. Feret. Gen. Civ. Mar. 3, '28.
Die Festigkeit des Mörtels und des Beton. (The Strength of Mortar and Concrete.) Schw. Bauz. Jan. 28, '28.

b. Metals

Welding Trusses for Industrial Buildings.* Andrew Vogel. Bost. Soc. C. E. Feb., '28.
Examples of Arc Welded Steel Construction.* Gilbert D. Fish. Bost. Soc. C. E. Feb., '28.
Ségrégation Négative, ou Inverse, et Tache Blanche.* (Negative, or Inverse, Segregation, and White Spots.) Louis Pichard. Gen. Civ. Feb. 11, '28.
Auftragschweissung (Schmelzschweissung).* (Built-Up Welding (Fusion Welding).) W. Hoffmann. Ver. deu. Ing. Feb. 18, '28.

c. Preservation and Use of Materials, Painting, Waterproofing

Treatment of Structural Members.* Earl Stimson. (Paper read before Am. Wood Preservers Assoc.) Can. Engr. Mar. 6, '28.

f. Rock Excavation, Mining, Rock Removal

Abstracts of Institute Papers. Min. & Metal. Mar., '28.

g. Execution of Works, Specifications

Bodenschwingung und Bauwerk.* (Earth Vibration and Construction.) Joachim Schultze. Z. d. Bauver. Feb. 1, '28.

1. Of Masonry

Report of the Committee on Masonry. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 9, '28.

2. Of Concrete

Concrete Chuted on Warehouse Job Under Modern Specifications.* Eng. & Contr. Feb., '28.
Sliding Forms Build Double Walls at High Speed.* Eng. N. R. Mar. 8, '28.
Concrete Testing Pointed Toward Construction Problems. (From papers read before Am. C. Inst.) Eng. N. R. Mar. 22, '28.

3. Of Wood

Report of the Committee on Wood Preservation. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 9, '28.

5. Of Reinforced Concrete

French Railway Station Built of Reinforced Concrete.* A. M. Roos. Eng. N. R. Mar. 15, '28.
Hangar en Béton Armè des Mines Dominiales de Potasse près de Mulhouse.* (Reinforced Concrete Shed for the Mines Dominiales de Potasse, near Mulhouse.) S. Joukoff. Gen. Civ. Feb. 4, '28.

h. Foundations, Bridge Piers, and Abutments

"Caisson to Rock" Foundation for Detroit Edison Co., Power House at Delray, Mich.* Eng. & Contr. Feb., '28.
The Science of Foundations—Its Present and Future.* J. Albert Holmes and Jacob Feld. Am. Soc. C. E. Mar., '28.
Digging Caissons for Tall Office Building in Chicago.* Eng. & Contr. Feb., '28.
Pneumatic Caissons Sealed at Record Depths, Using Quick-Hardening Cement.* C. K. Allen. Eng. N. R. Mar. 22, '28.

k. Tunnels and Tunneling-Shield

Intake Tunnel at San Diego Built by Novel Pneumatic Caisson Method.* Eng. N. R. Mar. 1, '28.
Large-Section Tunnel Construction at Asheville.* E. L. Hageman. Eng. N. R. Mar. 15, '28.

D. Highways

c. Construction

Fundamental Features of Gravel Road Construction in Washington. E. R. Hoffman. (Paper read before British Columbia Good Roads League.) R. & S. Feb., '28.
An Investigation of the Various Types of Low Cost Improved Roads. C. N. Conner. (Paper read before Highway Research Board.) R. & S. Feb., '28.
Asphalt Paving Mixtures. Francis P. Smith. (Paper read before Asphalt Pav. Conference.) R. & S. Feb., '28.
Sheet Asphalt Pavements at Buffalo, N. Y. George F. Fisk. (Paper read before Asphalt Pav. Conference.) R. & S. Feb., '28.
Florida Highways.* Paul L. Pierce. Cornell C. E. Feb., '28.
Reconstructing Old Highways to Meet the Present Day Requirements.* H. S. Perry. (Paper read before Purdue Road School.) R. & S. Feb., '28.
Notes on Roads and Road Bridges in Queensland.* J. R. Kemp. (Paper read before Inst. Engrs. Australia.) Comwlth. Engr. Feb. 1, '28.
Utilization of Local Materials for Paving Work in Wisconsin. E. F. Bean. (Paper read before Conference of Miss. Valley State Highway Comm.) R. & P. Mar., '28.
Tar Surface Treatments of Sandy Gravel Roads.* Geo. E. Martin. R. & S. Mar., '28.
Resurfacing Old Roads with Rock Asphalt on Bituminous Top.* A. H. Hinkle. R. & S. Mar., '28.
Surface Treatments with Asphalt as Used in West Virginia. B. E. Gray. R. & S. Mar., '28.
Resurfacing Old Stone and Gravel Roads with Bituminous Retread Top.* A. H. Hinkle. (Paper read before Annual Purdue Road School.) R. & S. Mar., '28.

Foundations and Drainage of Highways. Discussion: Harry Tucker and Winslow H. Herschel. Am. Soc. C. E. Mar., '28.
Design and Construction of Concrete Pavements. Discussion: R. T. Giles and Elmer G. Hooper. Am. Soc. C. E. Mar., '28.
Developments in the Art and Science of Asphalt Paving During 1927. Francis P. Smith. Pub. W. Mar., '28.
Low Cost Pavements for City Streets.* C. N. Conner. Pub. W. Mar., '28.
Recent Developments in Concrete Pavement Construction. H. Eltinge Breed. Pub. W. Mar., '28.
Granite Block Pavements During 1927. Clarence D. Pollock. Pub. W. Mar., '28.
Progress in Brick Paving Practice in 1927. John M. Egan. Pub. W. Mar., '28.
Improvement of Beverly Boulevard, Montebello, California.* Ormand A. Stone. West. Constr. N. Mar. 10, '28.
The Valona Slide and Highway Reconstruction Near Carquinez Strait Highway Bridge, California.* A. W. McCurdy. West. Constr. N. Mar. 10, '28.
Los Feliz Boulevard, Los Angeles.* John C. Shaw. West. Constr. N. Mar. 10, '28.
Reconstruction of El Camino Real, San Francisco.* J. E. Jellick. West. Constr. N. Mar. 10, '28.

d. Maintenance

Experiences of Minnesota in Maintenance of Secondary Type Roads. W. F. Rosenwald. (Paper read before Purdue Road School.) R. & S. Mar., '28.
L'Installation de Stockage et Réchauffage de Goudron de Chatel-Nomexy.* (Storage and Reheating Plant for Tar at Chatel-Nomexy.) Antoine. Ann. P. et C. Nov., '27.

h. Vehicles, Automobiles, Traffic

A Study of the Traffic Problem and Traffic Control.* Wm. S. Canning. R. & S. Feb., '28.
Widening Heavy-Traffic Street at Pontiac, Mich.* James R. Pollock and Frank C. Brownridge. Eng. N. R. Mar. 1, '28.

x. Miscellaneous

Papers read before Ontario Good Roads Association. Can. Engr. Feb. 28, '28.

E. Bridges, Viaducts and Arches

a. Timber Bridges and Viaducts

Design and Cost Data on Creosoted Timber Bridges in New Mexico.* E. B. Van De Greyn. R. & S. Mar., '28.
Report on Wooden Bridges and Trestles. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 7, '28.

b. Iron and Steel Bridges and Viaducts

Methods of Erecting a 2-Hinged Steel Arch of 531 Ft. Span.* Eng. & Contr. Feb., '28.
New Bridge Replaces Car Ferry on the Maine Central.* Ry. Age Mar. 10, '28.
Nouveau Règlement du Ministère des Travaux Publics, du 10 Mai 1927, sur les Ponts Métalliques.* (New Regulations of the Ministry of Public Works of May 10, 1927, on Iron Bridges.) Gen. Civ. Feb. 11, '28.

d. Concrete and Reinforced Concrete Bridges and Viaducts

The Mission and Hacienda Bridges, Alameda County, Calif.* George A. Posey. West. Constr. N. Feb. 25, '28.
Steel Plates Transfer Stress in Concrete Bridge Truss.* Eng. N. R. Mar. 15, '28.
The Arlington Memorial Bridge.* John L. Nagle. Mil. Engr. Mar.–Apr., '28.
Pont-Route en Béton Armé, sur le Lot, a Port-d'Agres (Aveyron).* (Reinforced Concrete Highway Bridge Over the Lot, at Port-d'Agres, Aveyron.) Ch. Dantin. Gen. Civ. Feb. 18, '28.
Eine Eisenbeton-Bogenbrücke mit Zugband in Tunis.* (A Reinforced Concrete Arch Bridge with Tie Members, in Tunis.) Eger. Z. d. Bauver. Feb. 8, '28.

g. Swing, Bascule, Lift, Floating, Oscillating Bridges, Traveling Cranes

Grues Legères pour Fourgons G. V., Permettant la Manutention Rapide de Fardeaux de Colis.* (Light Cranes for G. V. Cars, Permitting Rapid Handling of Packages in Quantity.) Garnier. Rev. Gen. Feb., '28.

h. Computations, Tests, etc.

Continuous Beams Over Three Spans.* I. Oesterblom. Am. Soc. C. E. Mar., '28.

F. Inland Waters and Waterways

c. Regulation of Waterways, Volumes of Discharge, Freshets, Floods, Soundings

Details of Army Engineers' Mississippi River Flood Control Plan.* Eng. & Contr. Feb., '28.
The Recording of River Discharge.* Nathan C. Grover. Mil. Engr. Mar.–Apr., '28.
The Mississippi River Problems. C. Mcd. Townsend. Mil. Engr. Mar.–Apr., '28.
Probability of Flood Flows. Discussion: F. G. Switzer. Am. Soc. C. E. Mar., '28.
Flood Control with Special Reference to the Mississippi River.* A Symposium. Discussion: C. S. Jarvis, Edward H. Schulz, Q. C. Ayres, H. S. Gladfelter and Byron E. White. Am. Soc. C. E. Mar., '28

d. Diverting Dams, Locks, Lifts, Elevators, Inclined Planes

The Severn Barrage Scheme.* J. Wulstan Twinberrow. Dock & Harbour Mar., '28.

j. River and Lake Ports, Equipment

Reconstruction of New Holland Pier.* Engr. Mar. 2, '28.

G. Maritime Works

a. Behavior of Movements of the Ocean

Tides and Their Engineering Aspects. Discussion: G. T. Rude. Am. Soc. C. E. Mar., '28.

c. Vessels and Maritime Navigation, Lighthouses, Buoys, Various Signals

XIVe Congres International de Navigation Tenu au Caire en 1926. (14th International Navigation Congress held in Cairo in 1926.) de Rouville and others. Ann. P. et C. Nov., '27.

h. Wharves, Mooring Buoys, Harbor Equipment

Le Port de Pèche de Lorient et son Frigorifique.* (The Lorient Fishing Port and Its Cold-Storage Plant.) Auguste Pawlowski. Gen. Civ. Mar. 3, '28.

i. Harbors (General Articles)

Gisborne Harbour Works, New Zealand.* Engr. Feb. 17, '28.
The Port of Philadelphia.* Dock & Harbour Mar., '28.
New Harbour Works for the Port of Bari, Italy.* Eng. Mar. 2, '28.

H. Railroads. Street and Interurban Railways. Automobiles. Aeronautics

a. Railroads

1. General Articles

Railroad Traffic in Peace and in War. H. E. Hale. Mil. Engr. Mar.–Apr., '28.
Report of Special Committee on Standardization. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 7, '28.
Report on Iron and Steel Structures. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 7, '28.

2. Location

Railway in Peru Relocated to Avoid Avalanches.* Eng. N. R. Mar. 1, '28.
Report on the Economics of Railway Location. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 8, '28.

3. Roadbed (Grading Construction Work)

Report of the Committee on Ballast. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 7, '28.
Report of the Committee on Roadway. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 9, '28.
Bau eines hochwasserfreien Eisenbahndammes vom Festlands nach der Insel Sylt.* (Construction of a Railway Embankment above High Water, from the Mainland to Sylt Island.) H. Pfeiffer and W. Mugge. Z. d. Bauver. Serial beginning Feb. 8, '28.

4. Track

Southern Pacific Eradicates Weeds.* Ry. Eng. & Main. Mar., '28.
Concrete Ties on the Pennsylvania Railroad.* Foster S. Bowden. Cornell C. E. Mar., '28.
Report of the Committee on Ties.* (Am. Ry. Eng. Assoc.) Ry. Age Mar. 7, '28.
Report of the Committee on Track.* (Am. Ry. Eng. Assoc.) Ry. Age Mar. 8, '28.
Report on Stresses in Railroad Track. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 9, '28.
Report of the Committee on Rail. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 9, '28.
Schiene und Rad. Werkstoffbeanspruchung und Schlupf bei Reibungsgetrieben.* (Rail and Wheel. Wear on Material and Slip in Friction Gears.) Rudolf Lorenz. Ver. deu. Ing. Feb. 11, '28.

5. Signals and Safety Apparatus

Improvements in Air Brakes.* C. C. Farmer. West. Ry. Club Jan., '28.
Progressive Modernization of Air Brake Maintenance Practice. E. F. Wentworth. West. Ry. Club Jan., '28.
Trains Directed by Signals.* Ry. Age Feb. 25, '28.
How Wisconsin is Solving the Grade Crossing Problem. Harry D. Blake. (From paper read before Miss. Valley Conference of State Highway Depts.) Ry. Age Mar. 3, '28.
Report on Highway Crossing Protection. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 6, '28.
Report of Committee on Standard Design. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 6, '28.
Report on Overhead and Underground Lines. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 6, '28.
Report on Economics of Signaling. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 6, '28.
Operating Trains by Signal Indication on Single Track.* E. B. DeMeritt. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 6, '28.
Report of Committee on Signaling Practice.* (Am. Ry. Eng. Assoc.) Mar. 6, '28.
Economic Advantages of Signals on the Seaboard. O. R. Teague. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 6, '28.
Report on D–C Automatic Signaling. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 7, '28.
Report on Power Interlocking Plants. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 7, '28.
Report on A.-C. Block Signaling. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 7, '28.
Report on Signals and Interlocking. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 8, '28.
Report of the Committee on Grade Crossings.* (Am. Ry. Eng. Assoc.) Ry. Age Mar. 9, '28.
Illinois Central Increased Capacity of Double Track by Either-Direction Signals.* Ry. Age Mar. 10, '28.

6. Rolling Stock, Fuel

Tank Engines on Express Trains.* Engr. Feb. 17, '28.
An Iceless Refrigerator Car.* Ry. Age Feb. 18, '28.
New Haven Acquires Ten Three-Cylinder Locomotives.* Ry. Age Feb. 25, '28.
High-Pressure Steam in Locomotives.* Edward C. Schmidt. Sci. Am. Mar., '28.
Battery-Oil-Electric Locomotive.* Ry. Age Mar. 3, '28.
Report of the Committee on Water Service. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 7, '28.

The Design and Proportion of Locomotive Boilers.* C. A. Brandt. (Abstract of paper read before Can. Ry. Club.) Ry. Age Mar. 10, '28.
A 65-Ft. Car for Steel Loading.* Ry. Age Mar. 10, '28.
Le Nouveau Matériel Métallique pour Trains Rapides de la Compagnie di Chemin de Fer du Nord.* (The New Steel Rolling Stock for Fast Trains of the Chemin du Fer du Nord Company.) de Caso. Rev. Gen. Feb., '28.
Die moderne Dampflokomotive und ihre Entwicklung im letzten Jahrzehnt.* (The Modern Steam Locomotive and Its Development in the Last Decade.) J. Rihosek. Oest. Ing. Arch. Ver. Feb. 3, '28.

7. Use of Electricity

Overhead Construction on the Great Northern.* A. M. Wright. Ry. Age Feb. 25, '28.
Report of the Committee on Electricity. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 8, '28.
Nouvelles Locomotives Electriques à Marchandises, Type 1C + C1, des Chemins de Fer Fédéraux Suisses.* (New Electric Freight Locomotives, Type 1C + C1, of the Swiss Federal Railroads.) Gen. Civ. Feb. 11, '28.
Le Chauffage des Voitures dans les Trains à Traction Electrique de la Compagnie d'Orleans.* (Car Heating in the Electric Trains of the Orleans Company.) Gen. Civ. Feb. 18, '28.
Die Elektrifikation der Schweizerischen Bundesbahnen und die Wirtschaftlichkeit des elektrischen Bahnbetriebes.* (The Electrification of the Swiss State Railways and the Economy of Electric Railway Operation.) A. Jobin. Schw. Bauz. Serial beginning Feb. 4, '28.

8. Stations, Terminals, Engine Houses, Shops

The New Railway Station and Goods Yard at Auckland, New Zealand.* P. B. Bryden. Comwlth. Engr. Feb. 1, '28.
Coal Terminal Renders Unusual Service.* Ry. Age Feb. 18, '28.
Yard Operations Made Safer by Floodlighting.* Ry. Age Feb. 18, '28.
Canadian Pacific Puts Supply Work on Wheels.* Ry. Age Feb. 18, '28.
New Shop Facilities Embody Many Distinctive Features.* Ry. Age Feb. 25, '28.
Cutting the Labor Expense on the Lackawanna.* Ry. Eng. & Main. Mar., '28.
Keeping Work Equipment in Service. C. R. Knowles. Ry. Eng. & Main. Mar., '28.
Getting the Most Out of Work Equipment.* C. C. Cook. Ry. Eng. & Main. Mar., '28.
Report of Committee on Rules and Organization. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 7, '28.
Report on Shops and Locomotive Terminals.* (Am. Ry. Eng. Assoc.) Ry. Age Mar. 7, '28.
Report of the Committee on Yards and Terminals.* (Am. Ry. Eng. Assoc.) Ry. Age Mar. 8, '28.
Report of the Committee on Buildings. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 9, '28.
I. C. Improves Material Handling.* W. S. Morehead. Ry. Age Mar. 10, '28.

9. Technical and Commercial Use

Train-Miles and Train-Hours Decrease.* Ry. Age Feb. 25, '28.
Moving the Canadian Grain Crop.* Ry. Age Serial beginning Mar. 10, '28.

b. Special Railroads

2. Aerial Railroads (Funicular, Monorail)

Aerial Tramways.* Discussion: George Paaswell and Casper D. Meals. Am. Soc. C. E. Mar., '28.

d. Street Railway, Elevated Railways, Subways

1. General Articles

Die Erschütterungen im Strassenbahnbetrieb.* (The Vibrations in Street Railway Operation.) Ph. Kremer. Ver. deu. Ing. Jan. 28, '28.

f. Aeronautics

3. Aeroplanes

The Design of Airplane Wing-Beams.* Joseph S. Newell. Am. Soc. C. E. Mar., '28.

I. Municipal Water-Works. Agricultural Engineering. Irrigation

a. General Articles

Hetch Hetchy Water Supply Project, San Francisco.* M. M. O'Shaughnessy West. Constr. N. Feb. 25, '28.
New Water Supply System for Yakima, Washington.* Charles F. Wilson. West Constr. N. Feb. 25, '28.
Present Status of the Valuation Problem Under Recent Federal Decisions. Joseph A. Beck. (From *Procedings* Penn. W. W. Assoc.) W. W. Mar., '28.
Management of a Municipally Owned Water Works. Frederick W. Albert. Am. W. W. Assoc. Mar., '28.
The Water Supply of Rochester, N. Y. Irving E. Matthews. Am. W. W. Assoc. Mar., '28.
Phases of Municipal Engineering.* John C. Pritchard. Mil. Engr. Mar.–Apr., '28.
London Municipal Water Works System.* E. V. Buchanan. Can. Engr. Mar. 6, '28.

b. Hydrology, Water Resources

Deep-Well Drilling for Water in Northern Illinois. (Paper read before Ill. Water-Well Drillers Conference.) F. J. Link. W. W. Mar., '28.
Ground Water Levels in Indiana. Charles Brossman. Am. W. W. Assoc. Mar., '28.
Rhein- und Grundwasser im Stadtgebiet Düsseldorf.* (Rhine Water and Ground Water in the Dusseldorf Region.) P. May Gesund. Ing. Feb. 4, '28.
Versuche über die Ergiebigkeit von Brunnen und Bestimmung der Durchlässigkeit des Sandes.* (Experiments on the Yield of Wells and Determination of the Permeability of Sand.) R. Ehrenberger. Oest. Ing. Arch. Ver. Serial beginnnig Mar. 2, '28.

c. Dams and Reservoirs

Uplift Pressure in Gravity Dams.* A. Floris. West. Constr. N. Jan. 25, '28.
Shasta River Hydraulic Fill Dam.* John A. Beemer. West. Constr. N. Jan. 25, '28.
Upward Pressures Under Dams: Experiments by the United States Bureau of Reclamation.* Julian Hinds. Am. Soc. C. E. Mar., '28.
Problems in Concrete Dam Construction on the Pacific Coast. Discussion: R. A. Hill. Am. Soc. C. E. Mar., '28.
Building a Rolled-Fill Dam of Prewetted Earth.* Ralph Lowry. Eng. N. R. Mar. 8, '28.
Designing a High Storage Dam for the Mokelumne Project.* F. W. Hanna. Eng. N. R. Mar. 15, '28.
Guniting Methods and Experiences at Cambridge Reservoir.* Charles E. Price. Eng. N. R. Mar. 22, '28.
St. Francis Dam Catastrophe—A Great Foundation Failure.* Nathan A. Bowers. Eng. N. R. Mar. 22, '28.
Le Reservoir de Taf Fechan (Angleterre).* (The Taf Fechan (England) Reservoir.) P. Caufourier. Gen. Civ. Feb. 4, '28.

d. Analysis and Purification of Water

Returned Sludge in Water Purification.* A. W. Bull (Paper read before Southwestern W. W. Assoc.) W. W. Mar., '28.
New Filtration Plant at Waukegan, Ill., Designed on Duplex Plan.* W. W. Mar., '28.
Turbidity and Coagulant Dosage.* Kenneth C. Armstrong. Am. W. W. Assoc. Mar., '28.
Sedimentation Studies of Turbid American River Waters.* A. W. Bull and G. M. Darby. Am. W. W. Assoc. Mar., '28.
Providence Filtration Plant. Pub. W. Mar., '28.
Oil-Well Pollution Necessitates Auxiliary Water Supply.* C. K. Mathews. Eng. N. R. Mar. 1, '28.
Flusskläranlage Hengstey.* (Hengstey River-Water Clarification Plant.) Spetzler. Gas und Wasser. Jan. 28, '28.

e. Distribution of Water

Orchard Mesa Pumping Plant, Grand Valley Reclamation Project, Colorado.* C. M. Day. West. Constr. N. Jan. 25, '28.
A Modern Pumping Installation.* J. S. Brown. Comwlth. Eng. Feb. 1, '28.
Pitometer Analysis of Distribution System Flow. P. J. Hurtgen. Am. W. W. Assoc. Mar., 28.

J. Sewerage. Sewage and Refuse Disposal

a. Sewers and Drains

Laying Sewer Pipe in Water.* Pub. W. Mar., '28.
Some Details of Storm-Water Sewer Overflows.* Alden Wells. Eng. N. R. Mar. 8, '28.
Practices in Placing Vitrified Clay Liner Plates in Sewers.* Eng. N. R. Mar. 15, '28.
Screened Drains for Engine Terminals at Chicago.* Eng. N. R. Mar. 15, '28.
Durch bergbauliche Senkungen beschädigte Entwässerungsanlagen des Stadtteiles Duisburg-Meiderich und ihre Wiederherstellung. (The Drainage System for Duisburg-Meiderich, Damaged by Mining Subsidences and Its Repair.) Wilhelm Seegert and Heinrich Schwarz. Gesund. Ing. Jan. 14, '28.
Zur Halbjahrhundertfeier der Berliner Stadtentwässerung.* (On the Semi-Centennial of the Berlin Municipal Drainage System.) Fritz Langbein. Gesund. Ing. Jan. 28, '28.

b. Sewage Disposal, Purification

Spent Gas Liquor in Relation to Sewage Disposal. H. Ross Hooper. Inst. Mun. & Co. Engrs. Feb. 21, '28.
Activated Sludge Plant Treatment of Packing House Wastes. Frederick G. Nelson. (Paper read before Iowa Sewage Treatment Conference.) W. W. Mar., '28.
Sludge Heating and Gas Collection at Antigo.* Anthony J. Fischer and Frank K. Quimby. Pub. W. Serial beginning Mar., '28.
Digestion of Vegetable Wastes and Screenings in Sewage Treatment Plants.* Willem Rudolfs and H. Heukelekian. (Paper 61, Dept. Sewage Disposal, N. J.) W. W. Mar., '28.
West Side Sewage-Works Construction at Chicago.* Eng. N. R. Mar. 1, '28.
Friction Loss in a 42-In. Sewage Force Main at Baltimore.* C. E. Keefer and R. T. Register. Eng. N. R. Mar. 1, '28.
Activated-Sludge Plant for Wahiawa, Hawaii.* F. M. Veatch. Eng. N. R. Mar. 22, '28.
Studien über Abwasserchlorung.* (Studies on Sewage Chlorination.) Haller. Tech. Gemein. Feb. 20, '28.

K. Heat Engines

b. Steam Turbines

Die rückgewinnbare Wärme im Dampfturbinen-Prozess.* (Recoverable Heat in the Steam Turbine System.) Th. Bremi. Schw. Bauz. Jan. 28, '28.

c. Gas and Oil Engines

A 1 750 B. H. P. Six-Cylinder Heavy-Oil Engine. Engr. Feb. 24, '28.

L. Electricity

d. Mechanical Uses of Electricity

3. Welding

Atomic Hydrogen Welding Process. P. Alexander. Bost. Soc. C. E. Feb., '28.
Reclaiming a Cast-Iron Waterwheel Casing.* C. W. Babcock. Bost. Soc. C. E. Feb., '28.
Applications of Projection and Multiple Welds. W. T. Ober. Bost. Soc. C. E. Feb., '28.
General Principles of the Various Welding Processes.* F. M. Farmer. Bost. Soc. C. E. Feb., '28.
Examples of Arc Welded Steel Construction.* Gilbert D. Fish. Bost. Soc. C. E. Feb., '28.
Welding Trusses for Industrial Buildings.* Andrew Vogel. Bost. Soc. C. E. Feb., '28.
Welding and Manufacturing of Large Electrical Apparatus.* A. P. Wood. A. I. E. E. Mar., '28.
Alteration of a Steel-Frame Building with Use of Welding.* Grayson Gill. Eng. N. R. Mar. 1, '28.

f. Signals and Communication

Certain Topics in Telegraph Transmission Theory.* H. Nyquist. A. I. E. E. Mar., '28.
La Commande à Distance des Embarcations par T. S. F. Vedettes Militaires Auché, à Commandes Systeme S. F. R.—Chauveau.* (Remote Control of Small Boats by Radio. Auché Military Vedettes with S. F. R.—Chauveau Control System.) Gen. Civ. Feb. 4, '28.
Les Caractères Generaux des Differents Systèmes de Telephonie Automatique.* (General Characteristics of the Different Systems of Automatic Telephony.) Charles Petit. Gen. Civ. Feb. 18, '28.

M. Architecture

a. Educational, Government and Scientific Buildings

Polizeibauten.* (Police Buildings.) Dammeier. Zeit. Bau. Jan., '28.

b. Business and Commercial Buildings

Das amerikanische Hochhaus.* (The American Skyscraper.) A. G. Jedliczka-Schneider. Oest. Ing. Arch. Ver. Serial beginning Feb. 3, '28.

c. Residences, Hotels

Stadtwohnungen im Rheinland.* (City Residences in the Rheinland.) Z. d. Bauver. Feb. 8, '28.

i. Fire and Earthquake Protection

A Modern Castle of Business.* Albert A. Hopkins. Sci. Am. Mar., '28.

x. Miscellaneous

Untersuchungen über die Schalldämpfung durch Baumaterialien.* (Investigations on the Damping of Sound by Building Materials.) M. Hahn and K. B. Eisenberg. Gesund. Ing. Jan. 21, '28.

O. Administration. Legislation. Economics. Statistics

b. Economic Questions of a General Character, Valuations

Minneapolis Construction-Cost Accounting System. Gustave A. Moe. Eng. N. R. Mar. 1, '28.

d. Administrative and Financial Management of Means of Communication

2. Routes and Roads

Demonstration of Responsibility a Pre-Requisite for Securing a Highway Contract. G. F. Schlesinger. (Paper read before Am. Road Bldrs. Assoc.) R. & S. Mar., '28.
What Organization Can Do for the Highway Contractor. A. H. Hunter. (Paper read before Am. Road Bldrs. Assoc.) R. & S. Mar., '28.
Scientific Planning of State and County Highway Improvements. J. Gordon McKay. (Paper read before Annual Purdue Road School.) R. & S. Mar., '28.
The Development of a Highway Transportation System for a County. (Comm. Report read before Am. Road Bldrs. Assoc.) R. & S. Mar., '28.

5. Railroads and Street Railways

Has Growth of Facilities Kept Pace with Traffic.* Ry. Age Feb. 18, '28.
Report on Uniform General Contract Forms. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 7, '28.
Report on Economics of Railway Labor. (Am. Ry Eng. Assoc.) Ry. Age Mar. 8, '28.
Report on Economics of Railway Operation. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 8, '28.
Report of the Committee on Records and Accounts. (Am. Ry. Eng. Assoc.) Ry. Age Mar. 9, '28.

Q. Surveying and Geodesy

The Triangulation of the United States.* William Bowie. Cornell C. E. Feb., '28.
Steel Towers for Surveys of United States Coast and Geodetic Survey.* J. S. Bilby. Eng. & Contr. Feb., '28.
Surveying and Mapping in the United States. Discussion: John C. H. Lee. Am. Soc. C. E. Mar., '28.

Design and Construction of First-Order Leveling Rod.* D. L. Parkhurst. Eng. N. R. Mar. 1, '28.
Field Operations of the Geodetic Survey. J. L. Rannie. (Paper read before Dominion Land Surveyors' Assoc.) Can. Engr. Mar. 6, '28.
Example of Mapping with Aerial Help. Chas. G. Holle. Mil. Engr. Mar.–Apr., '28.

S. City Planning

Cultural Opportunities in Regional Planning. Discussion: John Ihlder and Joseph Barnett. Am. Soc. C. E. Mar., '28.
Housing and the Regional Plan. Discussion: John Ihlder Am. Soc. C. E., Mar., '28.
The Planning of the Industrial City of Longview, Washington. Discussion: Brookes Baker and S. Herbert Hare. Am. Soc. C. E. Mar., '28.

T. Oil and Oil Engineering

Cementing Oil Wells to Shut Out Ground Water.* John F. Hough. Eng. N. R. Mar. 8, '28.

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CIVIL ENGINEER, M. Am. Soc. C. E., engaged in developing projects in the Northwest desires young associate on the Pacific Coast with engineering training and experience. $5 000 to $10 000 available capital required. Apply by letter. X4649–C–R–1568–S.

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MID-WESTERN LEADING UNIVERSITY has available a number of graduate and undergraduate civil engineering students for summer connections or longer. One or several applicants will be selected with such qualities and characteristics as may be specified. Can report early in June A–1584.

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CIVIL ENGINEER-EXECUTIVE, Assoc. M. Am. Soc. C. E.; age 42; twenty years' experience, including Latin-American development work covering municipal improvements and oil fields. Fluent knowledge of Spanish. Will go anywhere. A–4654.

HYDRO-ELECTRIC ENGINEER, Assoc. M. Am. Soc. C. E.; age 35; married; graduate engineer, Texas, 1913; Wisconsin, 1918. Three years' experience, heavy dock, coaling plant construction, Panama Canal; two years' responsible position, hydro-electric construction; four years' valuation hydro-electric; one year water, supply utilities. Good organizer, initiative, good judgment, unlimited interest in work, successfully completed every job started. Location, immaterial; foreign work considered. B–3135.

ASSISTANT PROFESSOR OF CIVIL ENGINEERING, Assoc. M. Am. Soc. C. E., B. S. in C. E., 1916; C. E. in 1922; age 34; married. Practical experience covers railroad construction, maintenance, valuation; all types of construction; design of public and industrial buildings; railroad structures; highway bridges. Teaching experience covers practically every subject in civil engineering. Desires position associate professor of civil engineering. B–3330.

CONSTRUCTION ENGINEER, Assoc. M. Am. Soc. C. E.; Michigan State Civil Engineering graduate; age 37. Four years, production and plant engineering; eleven years, heavy construction hydro-electric, industrial, and New York Subways. Just completed, as resident engineer, hydro-development, dam, penstock, power house, and transmission line. Desires position with good company. B–4052.

CIVIL ENGINEER, age 52, specializing in surveying and survey organization; recently on hydro-electric project maps with the plane table, experienced in highway and canal location in United States and Latin America. Experienced as responsible executive in both field and office of engineering works. Location, immaterial. B–4405.

CONSTRUCTION ENGINEER, Assoc. M. Am. Soc. C. E.; age 38; married. Fifteen years, major highway bridge, heavy foundations, and industrial construction including power plants, kilns, mill buildings. Qualified to design, estimate, inspect, and supervise. Registered civil engineer in Michigan and Indiana. Desires permanent position with industrial corporation or responsible assignment in county or State highway organization. Location, Central States. B–6009.

SALES ENGINEER OR ASSISTANT IN EXPORT SALES; age 32; married. Scandinavian. Nine years all around experience in designing and detailing steel and concrete for power stations, coal conveyors and general building construction. Has studied salesmanship at New York University. Location, New York or New Jersey preferred. B–6291.

GRADUATE ENGINEER, Assoc. M. Am. Soc. C. E.; age 35; Member, Am. Ry. Eng. Assoc.; eleven years railway maintenance of way, construction, and general engineering office work. Greater part of time in responsible charge. Desires position as principal assistant engineer or assistant chief engineer on railroad of medium size. Available on one month's notice. Salary, $350. B–6313.

CIVIL ENGINEER, Assoc. M. Am. Soc. C. E.. Twenty years' experience, railroad location, highway, precise surveys, irrigation, and reinforced concrete construction. Competent to make investigations for hydro-electric development, reports and estimates on engineering work. Thoroughly conversant with Latin-America. Will accept any reasonable foreign engagement. B–7494.

CIVIL ENGINEER, M. Am. Soc. C. E.; Master's Degree, Cornell; age 37. Six years, teaching varied civil engineering subjects; nine years' practice; four, miscellaneous work; five, sanitary, responsible position with cities, State, and private firm. Experience, design, construction, and operation of water supply and sewerage works; laboratory and experimental station; pollution studies. Desires sanitary engineering practice or professor of civil engineering. B–7678.

CIVIL ENGINEER, M. Am. Soc. C. E. Twenty-five years' experience on hydro-electric, irrigation, and highway work, also exploration. Intimately acquainted with conditions in Central America and the West Indies. Prepared to make investigations and reports or superintend construction or operation of Latin-American projects. B–7788.

EXECUTIVE ENGINEER, M. Am. Soc. C. E.; age 42. Twenty years' experience, design and construction, earthwork, concrete, irrigation, and drainage canals, construction and maintenance of roads, buildings, harbor works, surveys. Desires position with contractor. Location, Middle Atlantic or Southern States. B–8702.

CIVIL ENGINEER, Assoc. M. Am. Soc. C. E.; age 43; married. Seventeen years, railroad experience in office and field, including location, construction, and maintenance. Nine years with present employer on preparation of estimates and reports on grade reductions and new lines. Work costing more than $30 000 000 has been carried out. Open for position as Assistant Engineer, Chief Draftsman, or engineering assistant to operating official. B–9037.

ENGINEER, Jun. Am. Soc. C. E., with six years' experience, including two years, tropical work, on railroad and farm surveys; 3½ years, mostly subdivision, in complete charge of projects. Capable of handling all surveying, mapping, planning, and computing, or take charge of office. Available now. B–9908.

GRADUATE CIVIL ENGINEER, Jun. Am. Soc. C. E.; age 30. Experienced in design of steel, concrete, wood, estimating, surveying. Two years' field experience with contracting firm. Four years' experience with architects and engineering firms on apartment houses, theatres, warehouses, power plants, garages, other buildings. Desires position with building contractor. Willing to go any place. C–2633.

RECENT GRADUATE CIVIL ENGINEER, age 22; single, C. E., June, 1927. Experience in surveys for topography and property development. Location, New York City. C–188.

TRANSITMAN OR ASSISTANT CIVIL ENGINEER, college graduate, 1926; age 24; single. Has had practice in city engineering, highway work, and general city engineer's office work. Speaks Spanish. Willing to go to any location, if there is a good offer. C–214.

CIVIL ENGINEER, Assoc. M. Am. Soc. C. E.; technical graduate; age 38; married. Five years, general engineering; 10 years, municipal engineering. Desires position with consulting engineer or contractor. Will consider going into partnership for general consulting practice. Available at once. Location, anywhere. C–611.

SURVEYOR, CONSTRUCTION SUPERINTENDENT; age 38; married. Building foundations, retaining walls, preliminary surveying, bridges, hydro-electric development, topography, railroads, tunnels, etc. C–1635.

CIVIL ENGINEER, Jun. Am. Soc. C. E.; age 29; an Oriental; single; college graduate. Two years' experience in waterworks, surveying, and construction. Best references. Desires connection with concern operating in the Far East. C–1804.

CIVIL ENGINEER, Jun. Am. Soc. C. E.; graduate; age 32; married. 1½ years' experience, design of construction plans for concrete roads; 1 year, hydraulic designer on power plants; 1½ years, structural draftsman on maintenance and repairs of structures in steel plant. Location, New York City, or East. C–2085.

SUPERINTENDENT OF CONSTRUCTION, Assoc. M. Am. Soc. C. E.; graduate civil engineer; age 40; married. Fifteen years' engineering and business experience in contracting, construction, and design of industrial, commercial, and public buildings and structures; highway and railroad bridges, excavations and foundations, especially reinforced concrete. Desires responsible position with contractor, construction engineer. Location, United States. C–2887–1727–Chicago.

SUPERINTENDENT AND ESTIMATOR, Assoc. M. Am. Soc. C. E., buildings, New York City or vicinity; age 31; married. Ten years' construction experience, last five with general contractor, mostly high-class residential work, able to handle entire job, estimating, letting sub-contracts, buying materials, inspection, and supervision. Knows the value of pleased architects and owners. Salary secondary. Employed. C–3118.

TIMEKEEPER OR ASSISTANT SUPERINTENDENT; age 22; single; on building construction work, willing to travel in the United States. Location, preferably New York City. C–3197.

JUNIOR ENGINEER, Jun. Am. Soc. C. E.; age 23; single. Instrumentman; Inspector on concrete construction; Surveyor; will accept position in any civil engineering or allied work. Experience in structural steel design. Location, New York City. C–3230.

RECENT GRADUATE CIVIL ENGINEER, Jun. Am. Soc. C. E.; age 25; single; desires position on bridge erection, waterworks, or water-power project. Has had some experience in surveying and in structural steel detailing. Will go anywhere. Available immediately. C–3275.

CIVIL ENGINEER, Assoc. M. Am. Soc. C. E.; B. S. C. E., University of Colorado, 1927, for drafting, design or construction; age 33; married. Four years' experience (three years, Cuba), railway location and construction, mill layout and construction, concrete and frame design, sanitary water supply. Considerable chemical and bacteriological experience. Spanish working knowledge, and German. Location, any place. C–3570.

ASSISTANT JUNIOR ENGINEER, Jun. Am. Soc. C. E.; Protestant; age 21; single; recent graduate, civil engineering, New York University; four months' experience, building construction; six months, general, laying gas mains on piles, lining and grading tracks, laying out work, inspection. Location, preferably Eastern United States. C–3881.

CIVIL ENGINEER, Assoc. M. Am. Soc. C. E.; age 29; married. Cuban experience on railroad, bridges, reinforced concrete design and construction, surveys, drainage, etc. Five years, maintenance and plant engineer, manufacturing company in New Jersey. Speaks Spanish. Wants position with American company in Spanish America. Best references. C–3916.

DESIGNER, Assoc. M. Am. Soc. C. E.; Graduate Civil Engineer; age 32; married; Norwegian. Eight years' experience; five years in United States as draftsman, designer, and checker, reinforced concrete and structural steel for building construction and foundation works, for sewage disposal plants, industrial mills and plants, paper mills, crusher plants, silos, and power plants. Location, New York City, or the Middle West. C–3984.

CIVIL ENGINEER, M. Am. Soc. C. E.; age 46; married. Fifteen years' experience in responsible charge of work in the United States, Mexico, Central and South America. Speaks Spanish fluently and some Portuguese. Railway and highway surveys and construction; also tunnels, bridges, and mining operations. C–4267.

CIVIL ENGINEER, graduate, Swarthmore College; age 27. Experience in hydro-electric, golf course, municipal and building construction; hydro-electric development and surveying of various types. Executive experience in handling field parties, office work, and men on construction. Experienced in organization of men, standardizing of work. C–4277.

STRUCTURAL ENGINEER, Jun. Am. Soc. C. E.; M. S. degree in structural engineering, 1927; age 25; single. Reinforced concrete detailing experience. At present, teaching reinforced concrete and structural steel design. Desires position of structural nature, designing, teaching, or research. Location, immaterial. C–4287–1710–Chicago.

CIVIL AND HYDRAULIC ENGINEER, Assoc. M. Am. Soc. C. E.; college graduate; licensed; age 31; married. Ten years' actual experience, in charge of estimate and design of hydraulic power projects, thoroughly familiar with the design of reinforced concrete and structural steel work; one year sales experience. Speaks French and German. Location, anywhere, but would prefer New York City. C–4291.

CIVIL ENGINEER, Assoc. M. Am. Soc. C. E.; graduate of University of Minnesota, C. E. degree; age 37; married. Fourteen years' experience in design, estimates of cost, preparation of plans and construction of bridges, sewers, and hydraulic structures. C–4325–1720—Chicago.

SUPERINTENDENT, Jun. Am. Soc. C. E. Structural engineer with five years' experience as journeyman carpenter on building construction. Experience as carpenter foreman and assistant superintendent for large Eastern construction company. Has specialized in reinforced concrete and can make good costs. C–4326.

1928 GRADUATE CIVIL ENGINEER, Univ. of Florida, course in highway and railroad engineering. Interested in Central or South American positions. C–4329.

GRADUATE CIVIL ENGINEER from Middle West University, interested in foreign work. C–4330.

GRADUATE CIVIL ENGINEER, Jun. Am. Soc. C. E.; 5 years' experience, 4 years in field on topographic surveys, tunnel, railroad, and transmission line location; 1 year in office on concrete and steel design and details. Available on two weeks notice. C–4339.

1928 GRADUATE CIVIL ENGINEER interested in surveying or teaching. C–4346.

CIVIL ENGINEER, recent graduate; age 22; single. Specialized in structural design. One year's experience in concrete pavements and highway bridges. Desires position with construction company in the vicinity of New York. C–4348.

GRADUATE CIVIL AND SANITARY ENGINEER, Assoc. M. Am. Soc. C. E.; B. S., M. S., and C. E.; age 31; married. Two years, assistant, five years, chief engineer, State health department. Two and one-half years' teaching experience, recognized engineering school. Member, A. P. H. A. and A. W. W. A. Wishes responsible employment. Will teach sanitary engineering subjects. C–4360.

Membership

(From March 7 to April 3, 1928)

Additions

MEMBERS		Date of Membership.
ABELSON, Ole Andrew. Structural Engr., Tacoma Water Dept. (Res., 2204 East 35th St.), Tacoma, Wash.	M.	Nov. 14, 1927
ADAMS, Arthur Hartwell. City Engr. (Res., 2277 Pine Ave.), Long Beach, Calif.	M.	Mar. 5, 1928
AIVAZIAN, Harry. Care, Whitman, Requardt & Smith, Home Savings Bank Bldg., Albany, N. Y.	Jun.	Mar. 5, 1928
ANDREWS, Joseph. Asst. Engr., John F. Lynch, Box 152, West Haven, Conn.	Jun. Assoc. M.	Jan. 18, 1926 Mar. 5, 1928
ASHLEY, Carl. Chf. Engr., Am. Constr. & Dredging Co., 515 Marion Bldg., Cleveland, Ohio.	Assoc. M. M.	Dec. 2, 1914 Mar. 5, 1928
AZPURA CAPRILES, Fernando. Care, J. Fernando Capriles, Puerto Cabello, Venezuela	Jun.	Oct. 10, 1927
BAKER, George Franklin. Director of Public Service (Res., 629 Oxford Ave.), Dayton, Ohio.	M.	Mar. 5, 1928
BENFORD, William Ramsden. Instr. in Eng., Brown Univ. (Res., 982 Atwells Ave.), Providence, R. I.	Jun.	Mar. 5, 1928
BENSON, Frank Robert., Hydr. Engr., Newport News Shipbuilding & Dry Dock Co., Box 309, Newport News, Va.	Assoc. M.	Mar. 5, 1928
BERGHOLM, Axel Ovar. Insp., Port of New York Authority; 246 Academy St., Jersey City, N. J.	Jun.	Mar. 5, 1928
BLACKBURN, Dura Albert. Engr. in Chg., Delta Canal Co., S. A., Box 268, Calexico, Calif.	Assoc. M.	Mar. 5, 1928
BONEYSTEELE, Parke Lowe. Chf. Constr. Engr., Crown Bitumens Corporation, 315 Montgomery St., San Francisco (Res., 3100 Rawson St., Oakland), Calif.	Assoc. M.	Mar. 5, 1928
BONNER, John Pollock. Civ., Min. and Cons. Engr. (Scott & Bonner), Beckley, W. Va.	Assoc. M. M.	Jan. 15, 1917 Jan. 16, 1928
BRANDT, Evan William. 235 North Dithridge St., Pittsburgh, Pa.	Jun.	Nov. 14, 1927
BROWN, Hubert Hull. Res. Engr., State Highway Dept., Phoenix, Ariz.	Assoc. M.	Mar. 5, 1928
BROWN, John Thompson. Box 206, Dallas, N. C.	Jun.	Oct. 10, 1927
BULL, Anders Henrik. Asst. Engr., Board of Transportation, 49 Lafayette St., New York, N. Y.	M.	Mar. 5, 1928
BURNS, Thomas Morris. Sales Engr., T. A. Gillespie Co., 7 Dey St. (Res., 26 East 10th St.), New York, N. Y.	Affiliate	Mar. 5, 1928
BURSLEY, Allyn Parker. With A. D. Taylor (Res., 1864 Mannering Rd.), Cleveland, Ohio.	Assoc. M.	Mar. 5, 1928
BYRNE, William Gilman. Draftsman, C. M. & St. P. Ry., 1802 First Ave., North, Seattle, Wash.	Jun.	Dec. 5, 1927
CALLERI, Armand John. Asst. Engr., East Bay Water Co. (Res., 450 Fortieth St.), Oakland, Calif.	Assoc. M.	Mar. 5, 1928
CAMERON, Dugald John. Secy. and Gen. Sales Mgr., Fireproof Products Co., New York (Res., 261 Clinton Ave., New Rochelle), N. Y.	Assoc. M.	Mar. 5, 1928
CAMPBELL, Philip, Jr. Structural Engr., Emile Weil, Inc. (Res., 7318 Hickory St.), New Orleans, La.	Jun.	Mar. 5, 1928
CASHDAN, Hyman Harold. Engr., Eugene De Rosa, 15 West 44th St. (Res., 1410 Crotona Park East), New York, N. Y.	Assoc. M.	Mar. 5, 1928
CATTON, Miles Dewey. National Headquarters, Portland Cement Assoc., Highways and Municipal Bureau (Res., 7329 Clayton Court), Chicago, Ill.	Assoc. M.	Mar. 5, 1928
CLARK, Jason. Asst. Supt., Turner Constr. Co., 244 Madison Ave., New York (Res., 222 Martense St., Brooklyn), N. Y.	Jun.	Dec. 5, 1927
CLARK, LeRoy Walter. Prof., Mechanics, Rensselaer Polytechnic Inst.; Cons. Engr. (Res., 1988 Fifteenth St.), Troy, N. Y.	Jun. Assoc. M. M.	Sept. 4, 1906 April 4, 1911 Mar. 5, 1928
CLARK, Thomas Andrew. Care, Bureau of Reclamation, Harper, Ore.	Assoc. M.	Nov. 14, 1927
COLLINS, Harry Joseph, 1924 Park Ave., Dallas, Tex.	Jun.	Mar. 5, 1928
CRAIG, John Earl. Field Engr., Aetna Casualty & Surety Co., Hartford, Conn. (Res., 118 Oxford Ave., Roanoke, Va.).	Assoc. M.	Mar. 5, 1928
CRITSER, William Harold. Draftsman, City Engr.'s Office, Sewer Dept. (Res., 306 East 13th Ave.), Columbus, Ohio.	Jun.	Mar. 5, 1928
CRUZ, Manuel Marian. 133 Mercer Pl., South Orange, N. J.	Jun.	Oct. 10, 1927
DELL, George Harper. Instr., Civ. Eng., Univ. of Illinois, Urbana, Ill.	Assoc. M.	Mar. 5, 1928
DERBY, Elies Mayo. Instr., Civ. Eng., Brooklyn Polytechnic Inst. (Res., 1773 East 13th St.), Brooklyn, N. Y.	Jun.	Mar. 5, 1928
DIEMER, Robert Bernard. Res. Engr., Rio Mante Project, J. G. White Eng. Corporation, S. en C., Xicontencatl, Tamps., Mexico	M.	Mar. 5, 1928
DOBBINS, Earl George. Box 309, Chapel Hill, N. C.	Jun.	Nov. 14, 1927
DOOLAN, Jerome Kaseberg. With Barrett & Hilp, 918 Harrison St. (Res., 20 McLaren Ave.), San Francisco, Calif.	Jun. Assoc. M.	Oct. 11, 1920 Mar. 5, 1928

MEMBERS—(*Continued*)

		Date of Membership.
DRAKE, James Alexander. Mgr., Road Bldg. Dept., Benjamin Foster Co. (Res., 3701 Pulaski Ave.), Philadelphia, Pa....	Assoc. M.	Mar. 5, 1928
DURST, Ross Compton. Prof., Civ. Eng. and Head of Dept., Univ. of Akron, Akron, Ohio.....	Assoc. M.	Mar. 5, 1928
ELLISON, Walter David. Junior Drainage Engr., Div. of Agri. Eng., Bureau of Public Roads, Box 323, Fort Wayne, Ind....	Jun.	Mar. 5, 1928
ENEARL, Frank Allan. 731 East Broadway, Toledo, Ohio.....	Jun.	Nov. 14, 1927
ENGLISH, Charles Carmen. Constr. Engr., Yngenio Santa Fé C. por A., San Pedro de Macoris, Dominican Republic.....	Jun. Assoc. M.	Nov. 26, 1923 Mar. 5, 1928
EVANS, Walter Thomas. Draftsman, County Surv.'s Office (Res., 3825 South Hope St.), Los Angeles Calif.....	Assoc. M.	Mar. 5, 1928
FARRISEE, William James. Asst. Prof., Civ. Eng., Clarkson Coll. of Technology (Res., 100½ Market St.), Potsdam, N. Y.....	Assoc. M.	Mar. 5, 1928
FISHER, George J. 921 State St., Schenectady, N. Y.....	Jun.	Oct. 10, 1927
FLETCHER, Bob Jake. Parrott, Ga.....	Assoc. M.	Jan. 16, 1928
FRAME, Wayne Shannon. Asst. Engr., U. S. Geological Survey, Eng. Experiment Station, Columbus, Ohio.....	Assoc. M.	Mar. 5, 1928
FULLER, Joe Rice. Waterville, N. C.....	Assoc. M.	Mar. 5, 1928
GAHAN, Maurice Francis. Engr.-Accountant, Federal Water Service Corporation (Res., 254 Manhattan Ave.), New York, N. Y..	Assoc. M.	Mar. 5, 1928
GAMMAGE, Charles Edwin. Route 4, Box 50*a*, Hampton, Va....	Jun.	Dec. 5, 1927
GIFFORD, Leroy Deland. Engr., Seaboard Eng. & Contr. Co., Los Angeles (Res., 1314 North Hobart Boulevard, Hollywood), Calif.	Assoc. M.	Mar. 5, 1928
GLOCK, Alfred Robert. Designing Engr., City Transit Comm., 906 City-County Bldg. (Res., 2827 Philadelphia Ave., Dormont), Pittsburgh, Pa.	Assoc. M.	Mar. 5, 1928
GRAF, Emil Max. Engr., Meyer, Bowers & Ashley (Res., Y. M. C. A.), Glens Falls, N. Y.....	Jun. Assoc. M.	June 1, 1925 Mar. 5, 1928
GRANT, Ulysses Sumner. With O. H. O'Neill (Res., 221 Third Ave.), Santa Barbara, Calif.....	Assoc. M.	Mar. 5, 1928
GRAUSTEIN, Edward Adolf. Engr., 6 Beacon St., Boston, Mass..	M.	Mar. 5, 1928
GREENSHIELDS, Bruce Douglas. Acting Prof., Civ. Eng., Denison Univ., Granville, Ohio.....	Assoc. M.	Mar. 5, 1928
GREGOR, Michael. 7 East 42d St., Room 1002, New York, N. Y.,	Assoc. M.	Mar. 5, 1928
HALL, Maxcy Reddick. Asst. Chf. of Constr. in Chg. of Sewers (Res., 77 Thirteenth St., N. E.), Atlanta, Ga.....	M.	Jan. 16, 1928
HALLSTROM, Irving Thorell. Contr. (Hallstrom & Hallstrom), 949 Twentieth Ave., Seattle, Wash.....	Jun.	Mar. 5, 1928
HAMLIN, George Willis. Engr. of Constr., Cleveland Water Dept. (Res., 12913 Beachwood Ave., S. E.), Cleveland, Ohio.....	Assoc. M. M.	Jan. 17, 1921 Mar. 5, 1928
HANNING, Willis Cosine. Asst. Engr. and Insp., Bureau of Bldgs., Borough of Brooklyn (Res., 392 Sixth Ave.), Brooklyn, N. Y.....	Jun. Assoc. M.	Jan. 15, 1923 Mar. 5, 1928
HANSCOMB, Paul Clifford. Asst. Estimator, Edward Corning Co., New York (Res., 12 North 14th St., Flushing), N. Y.....	Jun.	Jan. 16, 1928
HARDING, James Clarke. Cons. Engr. (J. C. Harding), 170 Broadway, Room 1504, New York, N. Y.....	Jun. Assoc. M.	Nov. 21, 1921 Mar. 5, 1928
HARDY, Robert Leland. 306 North Wall St., Calhoun, Ga.....	Jun.	Oct. 10, 1927
HARGEN, Stanley. Asst. to Chf. Engr., Standard Oil Co. of New York, New York (Res., 133 Rutland Rd., Brooklyn), N. Y....	Assoc. M.	Mar. 5, 1928
HASIE, Coleman Lloyd. City Engr., Box 966, Memphis, Tex....	Assoc. M.	Mar. 5, 1928
HEINRICH, Emil Carl. With S. R. DeBoer Co., 515 East Iliff Ave. (Res., 1720 South Washington St.), Denver, Colo.....	Assoc. M.	Mar. 5, 1928
HELMIG, Augustine Mathias. County Surv., Gage County, Wymore, Nebr.	Assoc. M.	Mar. 5, 1928
HENDERSON, John Blythe Halton. 5302 Swiss Ave., Dallas, Tex..	Jun.	Nov. 14, 1927
HILLER, Robert J. Dist. Mgr., Steelform Contr. Co. (Res., 609 South Grand Ave.), Los Angeles, Calif.....	Assoc. M.	Mar. 5, 1928
HIRN, William Cullen. San. Engr., Pate, Bacon & Hamann, 12031 Stoepel St., Detroit, Mich.....	Assoc. M. M.	Nov. 26, 1918 Mar. 5, 1928
HOPPE, Friedrich Adolf. 4524 Malden St., Chicago, Ill.....	Assoc. M.	Mar. 5, 1928
HOSE, Harold Clarence. 1125 Proctor St., Port Arthur, Tex....	Jun.	Nov. 14, 1927
JACKSON, John Emery. Engr., Domill Constr. Co. (Res., 1955 Sedgwick Ave.), New York, N. Y.....	Assoc. M.	Mar. 5, 1928
JENSEN, Andrew Martin. Commr. of Public Works, City Hall, Fresno, Calif.	M.	Mar. 5, 1928
JESSUP, Angus Raymond. Designer, Bridge Dept., State Dept. of Highways and Public Works, Nashville, Tenn.....	Assoc. M.	Mar. 5, 1928
JOHNSON, Oliver Arthur. U. S. Engr. Office, Galveston, Tex...	Jun.	Oct. 10, 1927
JORGENSEN, Jorgen Kavlie. Constr. Engr., Byllesby Eng. & Management Corporation, Box 1101, Medford, Ore.....	Jun. Assoc. M.	Mar. 15, 1926 Mar. 5, 1928
KAMINSKY, Morris Moses. With W. J. Holliday & Co., 545 West McCarty St., Indianapolis, Ind.....	Jun. Assoc. M.	Nov. 15, 1926 Mar. 5, 1928
KARAKIZ, Socrates Michael. 1317 Randall Court, Madison, Wis.	Jun.	Mar. 5, 1928
KELLBERG, Frederick William. 170 Alta Rd., Oakland, Calif....	Jun.	Oct. 10, 1927
KEMAL, Achki. Civ. Engr., H. C. Willcox, 25 Broadway, Room 945, New York, N. Y.....	Assoc. M.	Mar. 5, 1928
KLEEBAUER, Félix Thadeus. Cucuta, Colombia.....	Assoc. M.	Nov. 14, 1927

MEMBERS—(*Continued*)

		Date of Membership.
LIPP, Morris Nathan. Chf. Draftsman and Designing Engr., City Eng. Dept., Miami Beach, Fla.	Assoc. M.	Mar. 5, 1928
LOVE, Joseph Warner Edwards. Pres., Keystone Gypsum Fireproofing Corporation, 305 North American Bldg., Philadelphia, Pa.	M.	Mar. 5, 1928
LYNCH, Paul Joseph. 3 Pitkin Pl., Pueblo, Colo.	M.	Mar. 5, 1928
LYONS, Emanuel, Jr. Box 847, Panama, Panama.	Jun.	Mar. 5, 1928
MACKENZIE, Donald Alexander. 91 Cambridge Ave., Stewart Manor, Garden City, N. Y.	Assoc. M.	Mar. 5, 1928
McCLAIN, Carl Arthur. Gen. Supt.-Secy., Eugene Water Board (Res., 1033 High St.), Eugene, Ore.	Assoc. M. M.	Sept. 12, 1916 Jan. 16, 1928
McGARRIGLE, Joseph James. 3748 Manayunk Ave., Philadelphia, Pa.	Assoc. M.	Oct. 10, 1927
McKOWN, Howard Purcell. Pres., J. Toner Barr Co. (Res., 18 Ann Arbor Ave., West View, Bellevue Branch), Pittsburgh, Pa.	Assoc. M. M.	Jan. 15, 1923 Mar. 5, 1928
MATHISSON, John Clarence. Deck Officer, U. S. Coast and Geodetic Survey, Washington, D. C.	Jun.	Nov. 14, 1927
MAYHEW, Wallace Nelson. (Montgomery Iron & Steel Co.) (Res., 117 East Mt. Pleasant Ave.), Philadelphia, Pa.	M.	Mar. 5, 1928
MEGRAW, William Adams. Gilman Apartments, Calvert and 31st Sts., Baltimore, Md.	Assoc. M. M.	Oct. 7, 1914 Mar. 5, 1928
MEMIJE y Vivencio del Rosario, Francisco Xavier. Project Engr. and Asst. Engr., Manila R. R., Manila, Philippine Islands.	Assoc. M.	Jan. 16, 1928
MENDELAVITZ, William. Junior Asst. Engr., Grade 1, State Highway Dept., 219 Greene St., Albany, N. Y.	Jun.	Nov. 14, 1927
MENSONE, James John. 504 South 7th St., Vineland, N. J.	Jun.	Mar. 5, 1928
MILLER, Aaron George. Supt., H. Miller & Sons' Co., 2565 Fifth Ave., Pittsburgh, Pa.	Jun.	Mar. 5, 1928
MILLER, Cecil Durward. Asst. to Engr. in Chg., Kansas City Terminal Ry. (Res., 2940 Forest), Kansas City, Mo.	Jun. Assoc. M.	Aug. 30, 1926 Mar. 5, 1928
MILLER, Frank William. Sales Engr., Lehigh Structural Steel Co. (Res., 18 South Muhlenberg St.), Allentown, Pa.	Jun. Assoc. M.	June 19, 1922 Mar. 5, 1928
MOLLER, Paul. Bridge Draftsman-Designer, State Highway Dept., Montgomery, Ala.	Assoc. M.	Mar. 5, 1928
MONAMY, Andre Robert Roger. 159 West 77th St., New York, N. Y.	Assoc. M.	Mar. 5, 1928
MORRIS, Albert Wood, Jr. Draftsman, Regional Planning Federation, 702 Morris Bldg., Philadelphia, Pa.	Jun.	Mar. 5, 1928
MORTON, Paul Steele. City Mgr., Alexandria, Va.	Assoc. M.	Mar. 5, 1928
MYERS, Walter Dow. Care, Pennsylvania Water & Power Co., Holtwood, Pa.	Jun.	Mar. 5, 1928
MYLIUS, Fred George. 2 South Clinton Ave., Trenton, N. J.	Jun.	Nov. 14, 1927
NALDER, William Henry. Asst. Chf. Designing Engr., U. S. Bureau of Reclamation, Wilda Bldg., Denver, Colo.	Assoc. M. M.	April 1, 1914 Jan. 16, 1928
NAPP, Samuel. Cons. Engr., 15 East 40th St., New York, N. Y.	M.	Mar. 5, 1928
NASH, Philip Curtis. Prof., Civ. Eng. and Dean, Antioch Coll.; Mayor (Res., 127 Davis St.), Yellow Springs, Ohio.	Assoc. M. M.	June 19, 1922 Mar. 5, 1928
NEVE, Henry Linn. Structural Draftsman, Gibbs & Hill, Inc., Pennsylvania Station (Res., 76 Charles St.), New York, N. Y.	Jun.	Oct. 10, 1927
OLIVER, Harold Joseph. Deck Officer, U. S. Coast and Geodetic Survey, Washington, D. C.	Jun.	Nov. 14, 1927
O'NEILL, Andrew Sabin (O'Neill Co.), 127 East Mermaid Lane, Chestnut Hill, Philadelphia, Pa.	Affiliate	Mar. 5, 1928
OTT, Leonard Eugene. Supt., A. Guthrie & Co., Inc., Ozark, Ill.	Assoc. M.	Mar. 5, 1928
PEDERSON, Louis Alphonzo. Instrumentman, Griggs Eng. Co., Box 312, Peoria, Ariz.	Jun.	Mar. 5, 1928
PERKINS, Albert Dashiell, Jr. Asst. Engr., M. of W., So. Ry., 1301 Market St., Room 201, Chattanooga, Tenn.	Assoc. M.	Mar. 5, 1928
PHANEUF, Victor Simeon. Engr., S. Belanger & Son, Inc. (Res., 122 Concord St.), Nashua, N. H.	Assoc. M.	Mar. 5, 1928
PHILLIPS, Kenneth N. Asst. Engr., U. S. Geological Survey (Res., 221 Portland Ave.), Medford, Ore.	Assoc. M.	Mar. 5, 1928
PHILLIPS, Laurence Joslyn. With Whidden-Beekman Co., Inc., 100 Arlington St., Boston, Mass.	Jun. Assoc. M.	Dec. 15, 1924 Mar. 5, 1928
PLUMMER, Fred Leroy. Asst. Prof., Civ. Eng., Case School of Applied Science, Cleveland, Ohio	Assoc. M.	Mar. 5, 1928
RABUCK, Arthur Jacob. Asst. City Planning Engr., Board of Public Land Commrs. (Res., 5019 Wisconsin Ave.), Milwaukee, Wis.	Assoc. M.	Mar. 5, 1928
RANDOLPH, Carl Lowell. With Southern California Edison Co., Los Angeles, (Res., 538 Naomi Ave., Arcadia), Calif.	Assoc. M.	Mar. 5, 1928
RASMUSSEN, Lauritz Herman. 2162 Twenty-ninth St., Queensboro, N. Y.	Jun.	Jan. 16, 1928
RATTI, Augustus Peter. Junior Hydr. and Geodetic Engr., U. S. Coast and Geodetic Survey, 202 Burke Bldg., Seattle, Wash.	Jun. Assoc. M.	Nov. 9, 1920 Oct. 10, 1927
REARDON, John Melvin. Asst. Constr. Engr., City of St. Paul, (Res., 1305 Grand Ave.), St. Paul, Minn.	Assoc. M.	Mar. 5, 1928

MEMBERS—(*Continued*)

		Date of Membership.
REED, Ralph. Detailer, Post & McCord, 101 Park Ave., New York, (Res., 306 Cumberland St., Brooklyn), N. Y.	Jun.	Mar. 5, 1928
RETTER, John A. Asst. Engr., The Finke Eng. Co. (Res., 1607 North Main St.), Dayton, Ohio	Jun.	Mar. 5, 1928
REYNOLDS, Thomas Myrick. Div. Engr., State Highway Comm. (Res., 1418 Madison St.), La Crosse, Wis.	M.	Mar. 5, 1928
RHOADES, Ralph Henry. 110 South Seneca, Bartelsville, Okla.	Jun.	Nov. 14, 1927
RICKETTS, Henry Palmer. Care, Asst. Engr.'s Office, Mo., Pac. R. R., Osawatomie, Kans.	Jun.	Nov. 14, 1927
RILEY, Aubie Hilton. Asst. Engr., Georgia Power Co. (Res., 2 Pryor St., N. E.), Atlanta, Ga.	Jun.	Nov. 14, 1927
RIPPSTEIN, John, Jr 4224 Barnes Ave., New York, N. Y.	Jun.	Mar. 5, 1928
ROBERTSON, Frank Brodnax. With Valuation Dept., N. & W. R. R. (Res., 209 Carolina St.), South Roanoke, Va.	Assoc. M.	Mar. 5, 1928
ROONEY, James Ignatius. 528 Acklin Ave., Toledo, Ohio	Assoc. M.	Jan. 16, 1928
ROSS-CLUNIS, Hayden. Box 145, R. F. D. 1, Hampton, Va.	Jun.	Dec. 5, 1927
ROUSCULP, John Allen. Senior Asst. Engr., Div. of Eng., City of Columbus (Res., 2546 Adams Ave.), Columbus, Ohio	Jun.	Jan. 16, 1928
RUCKDESCHEL, Charles Bernard. With P. R. R., Philadelphia Impvts. (Res., 1114 Marlyn Rd.), Philadelphia, Pa.	Assoc. M.	Mar. 5, 1928
SANDERSON, John Christopher. Constr. Engr., Sargent & Lundy (Res., 2705 Hartzell St.), Evanston, Ill.	M.	Mar. 5, 1928
SAVAGE, John Dana. Supt., T. Stuart & Son Co., 202 Main St., Waltham, Mass.	Assoc. M.	Mar. 5, 1928
SCHEIRER, Merrill Kleckner. Care, Barrow-Agee Laboratories, Inc., Box 1056, Memphis, Tenn.	Assoc. M.	Mar. 5, 1928
SCHULEEN, Ernest Theodore. 1206 Downtown Y. M. C. A., Pittsburgh, Pa.	Jun.	Dec. 5, 1927
SMITH, Colton Mumford, Jr. Chidester, Ark.	Jun.	Oct. 10, 1927
SMITH, Kenneth Alexander. 84 Fourth Ave., Malba., N. Y.	Jun.	Oct. 10, 1927
SPRAGUE, Embert Hiram. Prof. and Head, Dept. of Civ. Eng., Univ. of Maine, Orono, Me.	M.	Mar. 5, 1928
STEELE, Byram Whitmore. Engr., Bureau of Reclamation, 1441 Welton St., Denver, Colo	Assoc. M.	Mar. 5, 1928
STERN, Mitchel. Asst. to Gen. Mgr., Am. Iron Works Co., Inc., 1455 Broadway, Camden, N. J. (Res., 4145 Lancaster Ave., Philadelphia, Pa.)	Jun.	Mar. 5, 1928
STUBNER, Charles Ernest. Mgr. and Owner, Quantity Survey Bureau, Room 328, Balter Bldg., New Orleans, La.	M.	Mar. 5, 1928
STURM, Rolland George. Instr., Theoretical and Applied Mechanics, Univ. of Illinois (Res., 607 Ohio St.), Urbana, Ill.	Jun.	Mar. 5, 1928
SUTHERLAND, Robert Alexander. Designing Engr., Queensland Irrig. and Water Supply Comm., College Rd., Brisbane, Queensland, Australia	Assoc. M.	Jan. 16, 1928
SZLANDA, Stanley. 57 West 75th St., Apartment 30, New York, N. Y.	Jun.	Oct. 10, 1927
TIPPETT, David Gibb. Junior Engr., The Port of New York Authority (Res., 318 West 105th St.), New York, N. Y.	Jun.	Mar. 5, 1928
TOMLINSON, George Edmund. Gulfport, Miss.	Jun.	Nov. 14, 1927
TRUSS, Felix Warner. Asst. Engr., Morgan Eng. Co., 622 Goodwyn Inst. Bldg., Memphis, Tenn.	Assoc. M.	Mar. 5, 1928
TSCHUDY, Lionel Carl. Care, L. F. Harza, 919 Monadnock Bldg., Chicago, Ill.	Assoc. M.	Jan. 16, 1928
VOIGT, Paul Alexander. Asst. to Mgr., Industrial Div., Johns-Manville Corporation, 292 Madison Ave., New York (Res., 10909 Ninety-sixth St., Ozone Park), N. Y.	Jun.	Mar. 5, 1928
VOLLMER, Alexander Russell. Instrumentman and Draftsman with City Engr., Ocean City (Res., 7 North Cambridge Ave., Ventnor), N. J.	Jun.	Mar. 5, 1928
WALLER, John Andrew. Asst. Engr. and Instrumentman, M. B. Hodges, Teague, Tex.	Jun.	Mar. 5, 1928
WALTON, Alexander Young. 422 Gunter Bldg., San Antonio, Tex.	Assoc. M.	Mar. 5, 1928
WARREN, Lee Gilbert. Asst. Supt. in Chg., Eng., Jordan Dam, Alabama Power Co., Wetumpka, Ala.	Assoc. M. M.	May 15, 1917 Mar. 5, 1928
WEBB, Charles Marcus. 354 Thorman Pl., San Antonio, Tex.	Jun.	Jan. 16, 1928
WEBER, Frederick Spencer. Care, Harrington, Howard & Ash, 1012 Baltimore Ave., Kansas City, Mo.	Jun.	Mar. 5, 1928
WELCH, Edward Everett. Designer, Eng. Dept., City of Sacramento, Box 915, Sacramento, Calif.	Assoc. M.	Mar. 5, 1928
WERNENTIN, Edwin Gerhardt. Draftsman, C. R. I. & P. Ry. (Res., 6328 South Peoria St.), Chicago, Ill.	Jun.	Mar. 5, 1928
WHITE, William Erickson. Instr., Civ. Eng. Dept., The Rice Inst., Houston, Tex.	Assoc. M.	Mar. 5, 1928
WHITELAW, William Galloway. Engr. Draftsman, Township of Teaneck, Teaneck (Res., 68 Robinson St., West Englewood), N. J.	Assoc. M.	Mar. 5, 1928
WHITTLESEY, Harold Cruver. Structural Engr., S. O. Sprager (Res., 5443½ La Mirada Ave.), Los Angeles, Calif.	Assoc. M.	Mar. 5, 1928

MEMBERS—(*Continued*)		Date of Membership.
WICKERHAM, Philip Sheridan. Cons. Engr. for Cities of Sharon, Butler, and Corry, and Commrs. of Butler Township (Res., 339 North McKean St.), Butler, Pa.	Assoc. M.	May 19, 1924
	M.	Mar. 5, 1928
WILSON, Murray Alderson. Engr., Forestry, Fish, and Game Comm. of Kansas, State Fish Hatchery, Pratt, Kans.	Assoc. M.	Mar. 5, 1928
WISE, Joseph Alexander. Asst. Prof., Structural Eng., Univ. of Minnesota (Res., 3556 Forty-fourth Ave., South), Minneapolis, Minn.	Assoc. M.	Mar. 5, 1928
WRIGHT, Austin Roaber. Care, Nashville Bridge Co., Panama City, Fla.	Jun.	Oct. 10, 1927
YOUNG, Lewis Maxwell. Proprietor and Mgr., Connecticut Eng. & Contr. Co., 179 Broadway, Norwich, Conn.	Assoc. M.	April 6, 1909
	M.	Mar. 5, 1928

Deaths

BLUNT, William Titcomb. Elected Member, October 5, 1898; died March 3, 1928.
FLETCHER, Austin Bradstreet. Elected Member, June 1, 1909; died March 8, 1928.
HEYWORTH, James Ormerod. Elected Member, May 6, 1914; died March 15, 1928.
PATSTONE, Lewis Frederick. Elected Member, April 2, 1913; died August, 1927.
TILLMAN, Frank Andrew. Elected Associate Member, May 28, 1923; died August, 1927.
WHEELER, Bertrand Thorp. Elected Member, June 30, 1910; died March 20, 1928.

Total Membership of the Society, April 3, 1928

Members	**5 450**	
Associate Members	**5 760**	
Corporate Members		**11 210**
Honorary Members		**15**
Juniors		**1 669**
Affiliates		**141**
Fellows		**7**
Total		**13 042**